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## Parent-Child Interaction Therapy for Children with Autism Spectrum Disorder: An Analysis of Behavioral Patterns and Treatment Barriers

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Parent-Child Interaction Therapy for Children with Autism Spectrum Disorder:  
An Analysis of Behavioral Patterns and Treatment Barriers

by

Kimberly A. Knap

A dissertation submitted in partial fulfillment  
of the requirements for the degree of  
Doctor of Philosophy  
in School Psychology  
Department of Educational and Psychological Studies  
College of Education  
University of South Florida

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## **Abstract**

Children diagnosed with autism spectrum disorder (ASD) experience difficulties with social communication and restrictive, repetitive, and stereotyped behavior patterns that place them at an increased risk for developing challenging behaviors that warrant early intervention (American Psychiatric Association, 2013). These problems are unlikely to decrease without intervention. Research indicates that parents' involvement in behaviorally based interventions improves the functioning of children with ASD (Horner, Carr, Strain, Todd, & Reid, 2002). . Parent-Child Interaction Therapy (Eyberg & Funderburk, 2011) is an empirically supported intervention for young children with disruptive behaviors. PCIT shares similarities with numerous proven ASD treatments including caregiver involvement, structure and predictable schedule, and the use of behavioral strategies (e.g., positive reinforcement, differential attention). As such, children with ASD are increasingly referred to PCIT. Researchers and clinicians have started to address the use of PCIT for targeting child compliance and social responsiveness in children with ASD. However, there is a need for research on the feasibility of PCIT for children with ASD and barriers to treatment participation for these families. The present study utilized a non-concurrent multiple baseline design with three parent-child dyads enrolled in PCIT to examine the degree of stability and immediacy of effect in caregivers parenting skill use and in patterns of challenging behaviors, ASD symptoms, and expressive communication exhibited by young children with ASD. Due to a significant attrition rate in the study, barriers to treatment participation were also examined. Findings suggested that PCIT improved children's challenging behaviors and parent's use of labeled praises.

## **Chapter One: Introduction**

### **Statement of the Problem**

Recent estimates suggest that ASD affects approximately one million individuals in the United States and costs society over \$35-90 billion per year (Ganz, 2007). Children with ASD often experience deficits in social communication and development, placing them at a high risk for the development of challenging behaviors. The presence of these challenging behaviors directly correlates with fewer adaptive behaviors for children with ASD such as social skills and self-help behaviors (Matson, Mahan, Hess, Fodstad, & Neal, 2010). Challenging behaviors are often severely intense and may pose physical safety risks to the child and those around them (Matson, Wilkins, & Macken, 2009). As a result, children with ASD may experience limited access to educational and/or community opportunities (Matson et al., 2009; Sigafos, Arthur, & O'Reilly, 2003). These challenging behaviors often negatively impact the quality of life of children with ASD and their families. As such, parents often classify their child's challenging behaviors as the primary reason for referral to intervention services (Matson & Minshawi, 2006; Matson et al., 2009). Furthermore, if left untreated, these challenging behaviors are more likely to persist into adulthood and increase in severity as the child physically matures (Murphy, Beadle-Brown, Wing, Gould, Shah, & Homes, 2005).

Research on interventions for children with ASD heavily focuses on the provision of early intervention. Early intervention services often involve the application of behavioral strategies and emphasize generalization across settings (Simon, 2016). Children with ASD often participate in several different therapy activities that take up a tremendous amount of the

family's time. Maintaining this level of support for the child requires a great deal of parental time and often has financial implications for a family as well (Kohler, 1999). However, parental involvement in the treatment process results in a variety of positive outcomes for both the parent and child (National Research Council, 2001). The most established interventions for children with ASD also involve the child's parents in the treatment (National Research Council, 2001). Parents hold great expertise pertaining to their child's strengths and needs, as well as their educational background (National Autism Center, 2009; Organization for Autism Research Inc., 2004). Additionally, parents can provide significant information relevant to assessment and diagnostic procedures. They can also provide assistance with planning and setting goals for their children. Parents can be effective interventionists for their child's treatment (Burrell & Borrego, 2012; Campbell & Kozloff, 2007). The National Autism Center (2015) National Standards Project – Phase Two recently added parent training as an established intervention for children with ASD. Parent-Child Interaction Therapy (PCIT) is an evidence-based form of parent training used for children with challenging behaviors.

Parent-Child Interaction Therapy is a behaviorally based and empirically supported intervention that targets disruptive behaviors in young children aged 2 to 7 through applying behavioral contingencies and changing parent-child interactions (Eyberg, 1988; Gallagher, 2003). The theoretical basis of PCIT comes from both attachment theory (Ainsworth, 1989) and social learning theory (Patterson, 1982). Ainsworth's (1989) attachment theory emphasizes the importance of a warm and sensitive parenting style in order to establish stable attachment and foster a child's confidence that their needs will be attended to by their parent. This holds importance because a secure attachment fosters children's social, emotional, and behavioral development (Ainsworth, 1989; Coie, Watt, West, & Hawkins, 1993). Parent-Child Interaction

Therapy incorporates these attachment theory principles by directly teaching parents techniques used to engage in positive interactions with their child and foster a secure attachment.

Furthermore, Patterson's (1982) social learning theory states that children develop disruptive behaviors as a result of maladaptive interaction patterns with their parents. Parent-Child Interaction Therapy addresses maladaptive parent-child interactions by providing parents with techniques for setting clear and consistent limits in order to interrupt the maladaptive interaction patterns.

In the past, children with ASD were not referred to PCIT due to its strong emphasis on social contingencies, which are not typically perceived as motivating for children with ASD. However, due to the high prevalence of disruptive behaviors exhibited by children with ASD the number of referrals to PCIT clinics has steadily increased for this population (Masse, McNeil, Wagner, & Chorney, 2007). Despite increasing numbers of referrals for children with ASD to PCIT, little research exists that has examined the efficacy of PCIT for children with ASD.

### **Purpose and Research Questions**

Currently, several studies have examined the efficacy of PCIT for children with ASD. These studies have demonstrated that PCIT improved the challenging behaviors exhibited by children with ASD. Of note, four of the studies were clinical case studies (Agazzi, Tan, & Tan, 2013; Armstrong, DeLoatche, Preece, & Agazzi, 2015; Armstrong & Kimonis, 2012; Lesack, Bearss, Celano, & Sharp, 2014), two were non-concurrent single case design studies (Knap, 2015; Masse, McNeil, Wagner, & Quetsch, 2016), one was an A-B design with four participants (Hatamzadeh, Pouretamad, & Hassanabadi, 2010), and another was a wait-list control design that only included older males with ASD (Solomon et al., 2008). More importantly, these studies did not examine the effect of PCIT on children's ASD symptoms their use of expressive

communication. The purpose of the present study was to examine the degree of stability in patterns of challenging behaviors, ASD symptoms, and expressive communication use in young children with ASD. Parents' use of positive parenting practices was also examined for stability. The study originally set out to examine these changes from baseline to the end of PCIT; however, all of the dyads dropped out before completing treatment. Dyad 1 dropped out of treatment after completing four treatment sessions. Dyad 2 withdrew from treatment after completing six baseline sessions. Dyad 3 discontinued treatment after five baseline sessions. The significant attrition rate of the dyads posed a question as to what the barriers to the implementation of PCIT with children are diagnosed with ASD. This led to the development of additional research questions aimed at examining barriers to PCIT implementation from the parent participants' point of view. The present study used a single-case design with a mixed research design to address the following research questions:

1. How stable are patterns of challenging behaviors exhibited by children with ASD?
2. How stable are patterns of parents' use of positive parenting skills including their use of labeled praises, reflections, and behavior descriptions?
3. How stable are patterns of ASD symptoms exhibited by children with ASD?
4. How stable are patterns of expressive communication exhibited by children with ASD?
5. Are there any immediate treatment effects on parent's positive parenting behaviors or on children's challenging behaviors, ASD symptoms, or expressive communication from baseline to the start of PCIT?
6. What barriers interfere with participation in PCIT?

## **Significance of the Study**

Autism spectrum disorder is a complex developmental disability that affects 1 in 59 children (Baio, Wiggins, & Christensen et al., 2018). Children diagnosed with ASD experience difficulties with social communication and restrictive, repetitive, and stereotyped behavior patterns (APA, 2013). These core difficulties place children with ASD at an increased risk for developing disruptive behaviors that warrant early intervention. In addition, families of children with ASD are placed at a higher risk for emotional stress and economic burden caused by the high cost of treatments (National Autism Center, 2009). Children with ASD and their families greatly need access to evidence based treatments early on in the child's development in order to address the challenging behaviors exhibited by children with ASD. Parent-Child Interaction Therapy may benefit children with ASD and their families because it requires less time than other treatments, utilizes parents as the agent of behavior change, and can be accessed in many communities (Horner et al., 2002). Additionally, PCIT directly targets children's disruptive behaviors, which parents of children with ASD often cite as the primary reason for seeking intervention services (Mandell, Walrath, Manteuffel, Sgro, & Pinto-Martin, 2005). Preliminary studies provide evidence for the effectiveness of PCIT in reducing the disruptive behaviors exhibited by children with ASD (Agazzi et al., 2013; Armstrong & Kimonis, 2012; Armstrong, et al., 2015; Hatamzadeh et al., 2010; Lesack et al., 2014; Knap, 2015; Masse et al., 2016; Solomon et al., 2008). The study included three parent-child dyads enrolled in PCIT and examined how stable children's patterns of challenging behaviors, ASD symptoms, and expressive communication were, as well as how stable parents' use of parenting behaviors were. These stability patterns were compared to current PCIT research stability patterns. Furthermore, the study examined barriers to treatment participation.

## **Definition of Key Terms**

**Parent-Child Interaction Therapy (PCIT).** Parent-Child Interaction Therapy (Eyberg, 1988) is an evidence-based parent-training intervention used for young children between ages 2 and 7 with emotional and behavioral disorders. This therapy As a result, PCIT decreases children's challenging behaviors and increases children's pro-social behaviors.

**Autism spectrum disorder (ASD).** Autism spectrum disorder refers to a complex developmental disorder. Symptoms of ASD include impairments in social communication and interaction across multiple contexts, as well as restricted, repetitive patterns of behavior, interests, or activities. These symptoms must be evident in early childhood and cause impairments in daily functioning (APA, 2013). These symptoms place children with ASD at an increased risk for the development of challenging behaviors.

**Challenging behaviors.** Children with ASD experience symptoms including impaired social communication and interaction as well as restricted, repetitive patterns of behaviors, interests, or activities. These symptoms often lead to the development of challenging behaviors. For the purpose of the present study, challenging behaviors will include those that cause significant problems for the parent and/or child. Examples of challenging behaviors include disruptive behaviors (e.g., tantrums, aggression towards self or others, noncompliance, property destruction), as well as repetitive and stereotypical behaviors (e.g., hand flapping, echolalia).

**Positive parenting skills.** Parenting behaviors refer to the behaviors coded with the Dyadic Parent-Child Interaction Coding System-Fourth Edition (DPICS-IV; Eyberg, Nelson, Ginn, Bhuiyan & Boggs, 2013). The DPICS-IV is a five-minute coding observation used during PCIT in order to measure multiple parent and child behaviors. During the CDI and PDI phase of PCIT, the DPICS-IV assesses the frequency of parents' use of three positive parenting behaviors.

These three “Do” skills include labeled praises (e.g., “I love it when you use your inside voice!”), reflections (e.g., “Yes, that’s a red truck.”), and behavior descriptions (e.g., “You’re driving the train on the track.”). Parents’ “Don’t” skills during CDI are also recorded including questions (e.g., “What are you building?”), direct commands (e.g., “Sit down next to me.”), and indirect commands (e.g., “Would you like to sit down?”), and negative talk (e.g., “Stop doing that!”) during the session. Parents’ neutral talk (e.g., “I’m playing with the train.”) and unlabeled praises (e.g., “Good job.”) are also recorded. During the PDI phase, the DPICS-IV measures child compliance and non-compliance with their parent’s commands, in addition to the continued assessment of parents’ CDI skills. Specifically, parents are assessed on their ability to give direct commands with the appropriate follow-through sequence and children’s compliance or non-compliance with direct commands is recorded.



## **Chapter Two: Literature Review**

Autism spectrum disorder (ASD) is a developmental disorder characterized by deficits in social communication and interaction and by restricted interests and repetitive behaviors (APA, 2013). Currently, ASD affects 1 in 59 children and prevalence estimates indicate males are four times more likely than females to receive an ASD diagnosis (Baio et al., 2018). Autism spectrum disorder is associated with adverse outcomes in several domains including young children's behavioral, social-emotional, cognitive, and academic well-being (CDC, 2016). Research indicates that compared to typically developing children and other young children diagnosed with other forms of developmental delays, children with ASD experience more problems with challenging behaviors, early learning, and interacting with others (Wiggins et al., 2015). Early intervention services prior to the school age years can significantly alter ASD severity (Dawson et al., 2010, 2012), impact a child's ability to learn new skills (CDC, 2016) and reduce behavioral problems associated with ASD (Wilkinson, 2014). In addition, early diagnosis and participation in early intervention services can reduce the need for interventions over time (CDC, 2016).

The literature review that follows will describe the symptoms and behaviors exhibited by young children with ASD, as well as the evidence-based treatments available to these children and their families. The review will begin with the description, prevalence, etiology, comorbidities, and diagnostic procedures associated with ASD. Subsequent sections will describe the behavioral, social-emotional, language, cognitive, and academic outcomes for children with ASD followed by a review of evidence-based treatments for young children with

ASD. The chapter concludes with a detailed description of PCIT, empirical support for its use with children diagnosed with ASD, and the purpose of the present study.

### **Autism Spectrum Disorder**

The clinical origin of ASD began in the early 1900s when Bleuler coined the term in 1911 (Bleuler, 1950; Wilkinson, 2014). Leo Kanner (1943) first introduced the term to the medical literature as a clinical syndrome by describing autism as a group of behaviors. The characteristics of ASD behaviors he described are still used today and include social communication deficits, such as misreading non-verbal interactions, responding inappropriately during conversation, and difficulty building friendships with peers. In addition, individuals with ASD exhibit repetitive behaviors and interests such as extreme dependence on routines, high sensitivity to environmental changes, and intense focus on inappropriate items (APA, 2013). The symptoms exhibited by children with ASD fall on a continuum varying in severity, with some children showing mild symptoms and others showing more severe symptoms. This spectrum allows clinicians to account for the variations in behaviors and symptoms among individuals with ASD (APA, 2013).

**Prevalence.** Previously a rare disorder, ASD prevalence has progressively increased over the past decade. Most recent studies report that ASD occurs in approximately one in 59 children. The basis for this estimate comes from data collected in 2014 by the Autism and Developmental Disabilities Monitoring (ADDM) Network on a sample of 1,000 children who were 8 years old at the time (Baio et al., 2018). Overall, males are more likely to be diagnosed than females, with a ratio of 4 to 1 for males to females (Baio et al., 2018). The prevalence estimates for 2012 were nearly identical to 2010 estimates; however, the 2010 estimate revealed a 123% increase in ASD prevalence since 2002 (Christensen et al., 2016). Based on data collected in 2008, the 2010

estimate indicated that ASD affected approximately one in 88 children. This estimate was significantly higher than the 2009 estimate based on data collected in 2006 that reported that ASD affected one in 110 children (ADDM, 2010).

Although the exact cause for this increasing prevalence in ASD is unknown, research indicate that it may be linked to factors such as changed diagnostic criteria, improved diagnostic tools, and increased ASD awareness (ADDM, 2010; Wilkinson, 2014). For example, compared to the DSM-IV-TR diagnostic criteria, the DSM-V diagnostic criteria are broader with more inclusive definitions of ASD, which could result in more people being diagnosed with ASD (CDC, 2013). In addition, recent improvements to diagnostic tools incorporate measures of symptom severity to examine quantitative differences in symptoms exhibited by children with ASD, thus resulting in more heterogeneity in diagnosis (Constantino & Gruber, 2012; Wilkinson, 2014). Finally, increased autism awareness contributes to earlier symptom identification by parents and professionals, resulting in the ability of professionals to provide earlier and more accurate ASD diagnoses (Wilkinson, 2014).

**Etiology.** While the etiology of ASD is unknown, there are likely several factors that cause ASD such as the influence of environmental and genetic factors. Studies have identified differences in brain structure for individuals with ASD. For instance, functional imaging studies detected deficient connectivity within and between brain regions important for processing social information (Courchesne & Pierce, 2005; Wilkinson, 2014). In addition, neuroimaging and autopsy studies suggest an alteration in early development of normal brain processes such as increased cerebrum and cerebellar growth during the preschool years with a decrease in growth later on (Amaral, Schumann, & Nordahl, 2008; Wilkinson, 2014).

The majority of scientists agree that genes are one of the risk factors for ASD (Huguet, Ey, & Bourgeron, 2013). The role of genetics in ASD is evident by increased sibling occurrence rates, dizygotic twin concordance rates, and monozygotic (MZ) twin concordance rates (Messinger et al., 2013). Based on twin concordance rates, heritability estimates for ASD range from 37% to over 90% (APA, 2013; Bailey et al., 1995). Hallmayer and colleagues (2011) conducted a study using a population-based sample of diagnosed individuals and found concordance rates for ASD among MZ twin pairs of 58% for males and 60% for females. The researchers found concordance rates among DZ twins of 21% for males and 27% for females (Hallmayer et al., 2011). Currently, as many as 15% of ASD cases appear to be associated with a known genetic mutation (APA, 2013). Autism Spectrum Disorder occurs more often in individuals with certain genetic or chromosomal abnormalities such as fragile X syndrome and tuberous sclerosis (Gardener, Spiegelman, & Buka, 2011).

Although research demonstrates the role of genetics in ASD, MZ twin concordance rates are not 100%; therefore, other factors contribute to the etiology of ASD (Wilkinson, 2014). Recent studies have identified various environmental risk factors for ASD related to the prenatal period. Research indicates a higher risk of ASD with fetal exposure to the prescription drugs valproic acid and thalidomide during pregnancy (Christensen, 2013; Strömland, Nordin, Miller, Akerström, & Gillberg, 1994). In addition, advanced parental age (i.e., maternal age  $\geq$  35 years, paternal age  $\geq$  40 years) is consistently associated with a higher risk for ASD (Durkin et al., 2008; Shelton, Tancredi, & Hertz-Picciotto, 2010).

**Comorbidities.** Comorbid psychiatric disorders are common among children with ASD. According to the American Psychiatric Association (2013), approximately 70% of individuals with ASD may have one comorbid disorder and 40% with two or more comorbid disorders.

Leyfer and colleagues (2006) conducted a study of comorbidity rates in 109 children and adolescents with ASD and found that 44% met criteria for specific phobia, 37% for obsessive-compulsive disorder (OCD), 31% for attention-deficit/hyperactivity disorder (ADHD), 13% for depression, 12% for separation anxiety disorder, 7% for oppositional defiant disorder (ODD), and 2% for generalized anxiety disorder (GAD). In addition to comorbid psychiatric disorders, children with ASD experience other comorbid conditions. The most common of these comorbid conditions is intellectual disability, with comorbidity rates ranging between 40% (Baird et al., 2002) and 69% (Chakrabarti & Fombonne, 2001; Wilkinson, 2014). Furthermore, approximately 16% experience comorbid neurological problems and about 4% have at least one potentially causal genetic or neurological diagnosis (Levy et al. 2010). These high rates of comorbidity demonstrate the range of difficulties that may be experienced by children with ASD.

**Diagnosis.** The American Academy of Pediatrics (AAP) recommends ASD screening for all children at 18 and 24 months of age, in addition to regular developmental surveillance (AAP, 2016). Symptoms of ASD appear within the first three years after birth and can sometimes be detected at 18 months or even earlier in some cases. By two years of age, ASD diagnoses made by an experienced professional can be considered reliable (CDC, 2015; Lord et al., 2006; Moore & Goodson, 2003). However, on average children do not receive a final diagnosis until much later, typically around age 4 (CDC, 2015). According to the current literature, there is a 2.7 to 3.7-year gap between the potential age that an accurate diagnosis can be made and the actual age that children are diagnosed (Wilkinson, 2014). Many ASD diagnostic tools exist; however, no single tool should be used as the basis for an ASD diagnosis. Diagnostic tools typically rely on both caregivers' descriptions of their child's development and a professional clinician's observation of the child's behavior (CDC, 2016). In regard to the selection of diagnostic

measures, the Autism Diagnostic Observation Schedule (ADOS; Lord, Rutter, DiLavore, & Risi, 2001) and the Autism Diagnostic Interview-Revised (ADI-R; Rutter, Le Couteur, & Lord, 2003) are considered gold standard ASD diagnostic measures. The ADOS is both an observational measure and elicitation tool. The ADI-R is a standardized interview used with parents or caregivers of children with ASD.

The Diagnostic and Statistical Manual of Mental Disorders – Fifth Edition (DSM-5; APA, 2013) provides standardized criteria to classify and diagnosis symptoms associated with ASD. In order to meet DSM-5 criteria for an ASD diagnosis, children must exhibit three out of three behaviors and symptoms related to persistent deficits in social communication and social interaction across multiple contexts (e.g., lack of social or emotional reciprocity) and two of four behaviors and symptoms related to restricted repetitive patterns of behavior, interests, and activities. Each domain is assigned a separate severity level rating ranging from 1 to 3 (i.e., requiring support, requiring substantial support, requiring very substantial support). In addition, symptoms must be present in the early developmental period, cause clinically significant impairment in areas of current functioning, and are not better explained by intellectual disability (ID).

For some children, an ASD diagnosis might be clear for a practitioner using the DSM-5 criteria as a guide but in others, the diagnosis may be more challenging, especially when other comorbid disorders exist and/or when the child exhibits mild or variable externalizing behavioral symptoms (Johnson & Myers, 2007). Ideally, a team of child specialists with expertise in ASD should make the definitive diagnosis of ASD through the completion of an ASD comprehensive evaluation (Johnson & Myers, 2007). The three goals of a comprehensive assessment of a child referred for ASD include (1) determining the child's overall level of functioning, (2) making the

diagnosis of ASD, and (3) determining the extent of the search for an associated etiology. In order to accomplish these three goals, the American Academy of Pediatrics (2007) states that a comprehensive ASD evaluation should include the following components: (1) health, developmental, and behavioral histories, including a family history looking for the presence of an ASD and other developmental/behavioral problems in the extended family; (2) thorough physical exam, including looking for neurological abnormalities and dysmorphic features; (3) developmental and/or psychometric evaluation to determine both the child's overall level of functioning as well as specific patterns and discrepancies, such evidence for a discrepancy between social communication, motor-adaptive, and problem-solving skills; (4) determination of the presence of a DSM-5 diagnosis, preferably with a standardized autism-specific assessment tool that operationalizes current DSM criteria; (5) assessment of the caregivers' knowledge of ASD, challenges they experience, coping skills for challenges, and available supports and resources; and (6) laboratory examination guided by the previous five steps to search for a coexisting condition or known etiology (Johnson & Myers, 2007).

When appropriate, the evaluation should include information from multiple sources (e.g., caregivers, teachers) because the child's behavior and performance may differ among caregivers and settings. Information provided by parents has been shown to be useful and sufficiently reliable to inform the diagnostic process (Lord, Rutter, & Le Couteur, 1994). Parents are often asked questions pertaining to the family's health, developmental, and behavioral history, as genetics are a risk factor for ASD (Hallmayer et al., 2011). Parents can provide important information about their child's current functioning, as well as their strengths and weaknesses. Furthermore, parent involvement can demystify the evaluation process by allowing for discussion during the assessment procedures (Klin, Saulnier, Tsatsanis, & Volkmar, 2005).

## **Outcomes for Children with ASD**

Children with ASD exhibit difficulties in important areas of social functioning. According to the DSM-V (APA, 2013), these social functioning difficulties include deficits in social-emotional reciprocity (e.g., abnormal social approach, inability to initiate, sustain, or respond to back-and-forth conversation), deficits in nonverbal communicative behaviors (e.g., poor eye contact, lack of facial expressions), and deficits in developing, maintaining, and understanding relationships (e.g., lack of interest in peers, difficulty adjusting behavior to social context). These social functioning deficits are associated with problems such as high rates of externalizing behaviors, emotional distress, and difficulties in academics (Mazzone, Ruta, & Reale, 2012; Sikora, Vora, Coury, & Rosenberg, 2012; Wilkinson, 2014). Furthermore, the brain development disturbances associated with ASD emphasize the important linkage between the critical development processes of social interaction and language. Children with ASD often demonstrate atypical development with social and language milestones during early childhood. Communication symptoms associated with ASD involve atypical language development including delayed acquisition of single words and/or phrase speech, delayed or atypical extension of abilities, loss of formerly developed skills, and problems with conversational and socially appropriate use of communication (Stephanos & Baron, 2011). Given the impact of the symptoms and behaviors associated with ASD, the negative outcomes of ASD for young children will be examined in the following domains: behavioral, social-emotional, language/communication, cognitive, and academic.

**Behavioral outcomes.** A key feature of ASD is impairment in social functioning, which is associated with high rates of challenging behaviors (Ashburner, Ziviani, & Rodger, 2010). Challenging behaviors are defined as behaviors that are not socially acceptable, affect education



or living placement, or cause someone physical harm (Matson et al., 2010). Common challenging behaviors include aggression towards self or others, tantrums, property destruction, and non-compliance (Ashburner et al., 2010; National Research Council, 2001). Challenging behaviors are more common in children with ASD compared to typically developing children (Matson, Wilkins, & Macken, 2009; Nicholas, Charles, Carpenter, King, Jenner, & Spratt, 2008), children with learning impairments (Dixon, Kurtz, & Chin, 2008), children with ID alone (Holden & Gitlesen, 2006), and children with psychopathology (Matson, et al., 2009). Research indicates that an ASD diagnosis is a predictor of engagement in challenging behaviors (Hill, Powlitch, & Furniss, 2008). In addition, up to 94.3% of youth with ASD exhibit at least one challenging behavior (Matson et al., 2009).

Challenging behaviors may increase the likelihood of residential care, psychotropic medication use, and the use of physical restraints for children with ASD (Sturmey, Lott, Laud, & Matson, 2005). A direct correlation exists between challenging behaviors and fewer adaptive behaviors such as social skills and self-help (Vieillevoye & Nader-Grosbois, 2008). Challenging behaviors significantly impact the quality of life of children with ASD and their families (Matson & Minshawi, 2006). These behaviors contribute to an array of problems in the school environment and are major barriers to effective educational and social development (Horner, Carr, Strain, Todd, Reed, 2002; National Research Council, 2001). Specifically, teachers report that the high levels of challenging behaviors exhibited by students with ASD majorly impedes the delivery of educational services as a result of increased teacher and student stress, complicated academic instruction, and precluded inclusion in some educational settings (Rispoli et al., 2013).

**Social-emotional outcomes.** Challenging behaviors combined with social functioning deficits impact interactions and relationships with others in the school environment including peers, teachers, and school personnel. These impacted interactions and relationships may result in the social exclusion or isolation of children with ASD (Chamberlain, Kasari, & Rotheram-Fuller, 2007; Chung, Chung, Edgar-Smith, Palmer, & Huang, 2015; Montgomery et al., 2014). In addition, children with ASD experience difficulties making and keeping friends, which also places them at a high-risk for being bullied by their peers (Packer & Pruitt, 2010; Wilkinson, 2014). Some behaviors and traits exhibited by children with ASD are associated with becoming targeted for bullying such as rigid rule keeping, poor hygiene, obsessively talking about a favored topic, clumsiness, meltdowns, and inflexibility or rigidity. Research indicates that 63% of children with ASD are bullied at some point throughout their lives (Anderson, 2012). Anderson (2012) also found that the most common types of bullying include being picked on, teased, or made fun of (73%); being left out or ignored on purpose (51%); being called names (47%); and being shoved, pushed, slapped, hit, or kicked (nearly 30%). The high levels of challenging behaviors and low levels of social inclusion experienced by children with ASD have been associated with poor student-teacher in general education classrooms (Robertson, Chamberlain, & Kasari, 2003).

**Language/communication outcomes.** The most variable hallmark of ASD is language deficits. Inconsistent language abilities occur across the ASD population and within the linguistic skill range of individuals. Despite the variable nature of language abilities, children with ASD demonstrate impairments in both expressive and receptive language abilities to a greater extent than children with other developmental disorders (Hudry et al., 2010). Failure to develop appropriate language skills poses major concerns due to the central role of language to cognition

and the necessity of language use to function in daily activities (Stephanos & Baron, 2011). Impaired language acquisition poses major implications for socialization and communication and also effects children's behavioral regulation, emotional well being, and cognitive development (Stephanos & Baron, 2011). Recent research indicates that up to 40% of children with ASD develop some speech by 9 years of age and 15% of children remain nonverbal (Lord et al., 2006). Children with ASD may also experience difficulties in social language including pronoun reversal, impediments in pragmatic language use, and echolalia (Tager-Flusberg, 1999, 2000). In addition, children with ASD often exhibit deficits in communicative behaviors required for playing with others such as role-playing and imitation (Haq & Le Couteur, 2004).

**Cognitive outcomes.** Neuropsychological difficulties are common in children with ASD and are likely to interfere with school functioning. General intelligence varies substantially in individuals with ASD ranging from significantly impaired to superior. Cognitive functioning is strongly indicative of the type and severity of ASD symptomology. In particular, a strong negative correlation is often found between ASD symptom severity and cognitive intelligence (Spiker, Lotspeich, Dimiceli, Myers, & Risch, 2002; Wilkinson, 2014). Children with ASD often experience difficulties in three main areas of cognitive functioning, theory of mind, executive functioning, and central coherence. Theory of mind pertains to the ability to conceive the mental states or perspectives of others (Wilkinson, 2014). This impairment in children with ASD is likely due to the social communication deficits associated with ASD (Baron-Cohen, Leslie, & Frith, 1985; Premack & Woodruff, 1978). Additionally, children with ASD often experience deficits in executive functioning skills such as planning, inhibition, organization, and self-monitoring (Hill, 2004). Furthermore, central coherence is a common deficit associated with ASD. Central coherence pertains to one's ability to see the "big picture" or to discern the overall

meaning of information or an event (Happé & Frith, 2006). These cognitive deficits contribute to a variety of academic problems and difficulties at school including low participation in collaborative activities (Ruble & Robson, 2007), difficulty adhering to daily classroom routines (National Research Council, 2001), low academic achievement (Brown & Klein, 2011; Turner-Brown, Lam, Holtzclaw, Dichter, & Bodfish, 2011; Huemer & Mann, 2010), and high rates of disruptive behavior (Lecavalier, 2006).

**Academic outcomes.** Social impairments in children with ASD can also significantly interfere with classroom performance and learning, especially learning through social interactions and in settings with peers (APA, 2013). Children with ASD experience extreme difficulties in essential academic skills such as planning, organization, and coping with change, which negatively impact their academic achievement (APA, 2013). In addition, approximately 67% of children with ASD and normal intelligence have a learning disability (Mayes & Calhoun, 2006; Wilkinson, 2014). Mayes and Calhoun (2006) conducted an additional study and found that 60% of children with ASD exhibited learning disabilities in written expression, 23% in math, 9% in spelling, and 6% in reading. In general, decoding is a relative strength for children with ASD, whereas writing and reading comprehension tend to be relative weaknesses (Mayes & Calhoun, 2003; Wilkinson, 2014). In addition, general cognitive development influences math performance (Mayes & Calhoun, 2003) and children with high functioning ASD may score at average levels in math computation (Minshew, Goldstein, Taylor, & Siegel, 1994; Wilkinson, 2014).

### **Evidence-Based Interventions for Children with ASD**

In the past, ASD was considered to be untreatable; however, now many evidence-based interventions exist for ASD that result in improved outcomes for individuals diagnosed with

ASD (National Research Council, 2001). A universal intervention for ASD does not exist; therefore, a comprehensive assessment should be conducted in order to determine the needs of the individual and/or their family (Simpson, 2005; Wilkinson, 2014). Although a universal intervention does not exist, research indicates that the most empirically supported interventions are those based on a behavioral model (National Research Council, 2001). Evidence-based interventions for young children with ASD typically include a comprehensive curriculum and intensive treatment delivery across brief time periods (e.g., 15-20 minutes) for a total of approximately 25 hours per week with a minimum of five days a week. Other key intervention components include parental involvement, planned teaching opportunities, sensitivity to development, and certified practitioners (Beauchaine & Hinshaw, 2013; Simpson, 2005).

The National Autism Center (2015) developed the National Standards Project (NSP) in order to provide important information regarding effective interventions for individuals diagnosed with ASD. As the primary initiative of the National Autism Center, Phase Two of the NSP addresses the need for evidence-based practice guidelines for ASD. The National Autism Center developed the Scientific Merit Rating Scales (SMRS) to evaluate the rigor of methods employed in studies and to determine the effectiveness of an intervention for individuals with ASD (National Autism Center, 2015). In order to determine the extent to which interventions are effective, the following five critical dimensions of experimental rigor are examined on the SMRS: 1) research design, 2) measurement of the dependent variable, 3) measurement of the independent variable, 4) participant ascertainment, and 5) generalization and maintenance effects. Interventions are classified based on an evidence classification system. Only interventions considered “established” by the NSP2 will be reviewed in the following literature review. “Established” interventions meet the following criteria: (a) several published and peer

reviewed articles, (b) SMRS scores of 3, 4, or 5, and (c) beneficial treatment effects for a specific target. The National Autism Center's National Standards Project Phase Two identified twelve established interventions for young children with ASD. Table 1 provides a summary of the key features of the twelve interventions described above.

Table 1

*Description of Established Interventions for Children with ASD*

Description	Articles Reviewed		Ages	Skills Increased	Behaviors Decreased
	NSP1	NSP2			
<b>Behavioral Interventions</b>					
Antecedent interventions alter events before occurrence of target behavior and consequent interventions change environment after the target behavior occurs	298	155	3-21	<ul style="list-style-type: none"> <li>• Higher cognitive functions (NSP2)</li> <li>• Motor skills (NSP2)</li> <li>• Academic, learning readiness, interpersonal, communication, self-regulation, play, personal responsibility (NSP1&amp;2)</li> </ul>	<ul style="list-style-type: none"> <li>• Sensory or emotional regulation (NSP1)</li> <li>• Problem behaviors (NSP1&amp;2)</li> <li>• Restricted, repetitive, nonfunctional patterns of behavior, interests, or activity (NSP1&amp;2)</li> </ul>
<b>Cognitive Behavioral Intervention Package (CBIP)</b>					
Often includes an educational component, cognitive restructuring, emotional scale development, homework, parent sessions	3	10	6-14	<ul style="list-style-type: none"> <li>• Higher cognitive functions (NSP1)</li> <li>• Interpersonal, personal responsibility, placement (NSP2)</li> </ul>	<ul style="list-style-type: none"> <li>• Problem behaviors (NSP2)</li> <li>• Sensory or emotional regulation (NSP2)</li> </ul>
<b>Comprehensive Behavioral Treatment for Young Children (CBTYC)</b>					
Intensive EBIs based on ABA and targeting essential skills (e.g., social, communication, pre-academic/ academic)	21	20	0-9	<ul style="list-style-type: none"> <li>• Play (NSP1)</li> <li>• Academic/learning readiness (NSP2)</li> <li>• Communication, higher cognitive functions, personal responsibility, interpersonal (NSP1&amp;2)</li> <li>• Motor skills (NSP1&amp;2)</li> </ul>	<ul style="list-style-type: none"> <li>• General symptoms (NSP1&amp;2)</li> <li>• Problem behaviors (NSP1&amp;2)</li> </ul>
<b>Language Training (Production)</b>					
Targets a child's ability to produce verbal communication using various strategies (e.g., modeling, prompting)	10	2	3-9	<ul style="list-style-type: none"> <li>• Interpersonal, play (NSP1)</li> <li>• Communication (NSP1&amp;2)</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>

Table 1 (Continued)

Description	Articles Reviewed		Ages	Skills Increased	Behaviors Decreased
	NSP1	NSP2			
<b>Modeling (Live or Video)</b>					
Models correct demonstration of target behaviors to a child learning new skills	51	28	3-18	<ul style="list-style-type: none"> <li>• Higher cognitive functions (NSP1)</li> <li>• Academic (NSP2)</li> <li>• Communication, interpersonal, play, personal responsibility (NSP1&amp;2)</li> </ul>	<ul style="list-style-type: none"> <li>• Problem behaviors (NSP1)</li> <li>• Sensory or emotional regulation (NSP1)</li> </ul>
<b>Naturalistic Teaching Strategies (NTS)</b>					
Teaches children adaptive skills across environments using naturally occurring activities	27	3	0-9	<ul style="list-style-type: none"> <li>• Interpersonal, play (NSP1)</li> <li>• Learning readiness (NSP2)</li> <li>• Communication (NSP1&amp;2)</li> </ul>	• N/A
<b>Parent Training</b>					
Parents learn to implement strategies and use skills pertaining to play, sleep routines, imitation, commenting, joint attention, expectant waiting	37	11	0-18	<ul style="list-style-type: none"> <li>• Interpersonal, play (NSP1&amp;2)</li> </ul>	<ul style="list-style-type: none"> <li>• General symptoms (NSP2)</li> <li>• Problem behaviors (NSP2)</li> <li>• Restricted, repetitive, nonfunctional behavior, interests, or activity (NSP2)</li> </ul>
<b>Peer Training Package</b>					
Training a child's peers on methods used to initiate and respond during social interactions	43	3	3-14	<ul style="list-style-type: none"> <li>• Learning readiness (NSP2)</li> <li>• Communication, interpersonal (NSP1&amp;2)</li> </ul>	<ul style="list-style-type: none"> <li>• Restricted, repetitive, nonfunctional behavior, interests, or activity (NSP1)</li> </ul>



Table 1 (Continued)

Description	Articles Reviewed		Age Range	Skills Increased	Behaviors Decreased
	NSP1	NSP2			
<b>Pivotal Response Training (PRT)</b>					
Teaches children to respond and aims to increase independence from prompting; targets motivation, self-management, self-initiation, responsiveness to multiple cues	11	6	3-9	<ul style="list-style-type: none"> <li>• Interpersonal (NSP1)</li> <li>• Learning readiness (NSP2)</li> <li>• Communication, play (NSP1&amp;2)</li> </ul>	• N/A
<b>Schedules</b>					
Identifies specific activities and completion order to allow child to plan for upcoming activities and increase independence	11	2	3-9	<ul style="list-style-type: none"> <li>• Self-regulation (NSP1&amp;2)</li> </ul>	• N/A
<b>Scripting</b>					
Provides child with a written or verbal script as a model to initiate/respond in situations	6	5	3-14	<ul style="list-style-type: none"> <li>• Play (NSP2)</li> <li>• Communication, interpersonal (NSP1&amp;2)</li> </ul>	• N/A
<b>Story-Based Interventions</b>					
Teaches children to manage challenging situations by identifying target behaviors and situations for behaviors	21	15	3-14	<ul style="list-style-type: none"> <li>• Communication, learning readiness (NSP2)</li> <li>• Interpersonal, self-regulation (NSP1&amp;2)</li> </ul>	• Problem behaviors (NSP2)

*Note.* NSP1= National Standards Project Phase One; NSP2= National Standards Project Phase Two.

The existing literature base widely recognizes that the most empirically validated treatments for children with ASD are those based on a behavioral model (National Research Council, 2001). The National Standards Project Phase Two (NSP2) included the addition of Parent Training Interventions as an established intervention for children with ASD. According to the National Autism Center (2015), this addition highlights the integral role of parents in providing a therapeutic environment for children with ASD. Parent training facilitates the generalization of the skills learned in treatment across other settings such as the home and school, which holds importance for children with ASD because they often experience difficulties with spontaneously demonstrating learned skills across settings and situations (Burrell & Borrego, 2012). In addition, parent training increases the amount of intervention that the child receives (Burrell & Borrego, 2012; McConachie & Diggle, 2007). Parent-Child Interaction Therapy is an intensive form of parent training with strong empirical support for use with young children exhibiting emotional and behavioral disorders. Children with ASD commonly exhibit challenging behaviors as a result of their ASD symptoms. Parent-Child Interaction Therapy may be an appropriate intervention for children with ASD and their families because it teaches parents how to effectively manage their child's behavior in order to reduce those challenging behaviors that impede children's healthy development and family routines (Bagner & Eyberg, 2007). Researchers continue to dedicate time to the identification of evidence-based treatments for children with ASD; however, the intervention research literature for interventions targeting children and lacks information regarding the factors that affect their ability to adhere to and complete treatments.

**Attrition.** A great deal of evidence illustrates that these interventions are effective and that families who participate in treatment experience improved outcomes; however, rates of early treatment termination are extremely high. Community settings that provide parent and child therapy services experience numerous challenges, especially with retaining families for treatment. Parent and child therapy programs have been documented to have dropout rates as high as 60% (Fox & Holtz, 2009; Kazdin, 1996). Early intervention research for children with ASD urges practitioners to maintain records of attrition in early intervention (Lord et al., 2005); however, intervention research often resorts to reporting attrition rates but does not explore the factors that contribute to attrition rates.

### **Parent-Child Interaction Therapy**

Parent-Child Interaction Therapy is an evidence-based intervention for young children exhibiting emotional and behavioral disorders. This intervention integrates components of both behavioral and attachment theories, as well as aspects of play therapy in order to improve the parent-child relationship and change maladaptive parent-child interaction patterns. PCIT aims to increase children's pro-social behaviors and enhance parents' proactive behavior management skills (Eyberg, 1988). PCIT involves both the parent and child in the treatment and utilizes a live coaching model where the therapist coaches the parent on the skills taught in treatment through a "bug-in-the-ear" device. This allows the therapist to monitor the parent and child through a one-way mirror and provide immediate verbal feedback to the parent throughout the duration of the session. The advantages of this approach include therapist support, guidance, and immediate feedback during the parent-child interaction (Burrell & Borrego, 2012). More importantly, with the in-vivo approach the parent becomes the agent of change in their child's behavior, which is associated with continuous improvement and positive outcomes for children (Horner et al.,

2002). Parent-Child Interaction Therapy shares similarities with treatments developed for children with ASD such as the application of ABA principles, emphasis on positive parent-child relationships, and use of toys familiar to the child (Burrell & Boreggo, 2012).

**Purpose and goals.** The main goals of PCIT include improving the quality of the parent-child relationship, decreasing challenging behaviors, increasing children's prosocial behaviors, improving parenting skills, and decreasing parents' stress (Eyberg, 1988; National Child Traumatic Stress Network, 2004). PCIT consists of two phases, which focus on teaching parents two sets of parenting skills. The first phase of PCIT, Child Directed Interaction (CDI) focuses on building a warm and responsive parent-child relationship. During the second phase, Parent-Directed Interaction (PDI), parents learn how to deliver commands and use discipline strategies in order to decrease their child's challenging behaviors and increase their child's compliance (Eyberg, 1988). Additionally, PCIT places an emphasis on fidelity and utilizes weekly fidelity checklists during treatment (Eyberg, 1988).

**Theoretical underpinnings.** PCIT integrates aspects of attachment theory, behavioral theory, and social learning theory in order to improve the parent-child relationship. PCIT emphasizes nurturance and limit setting from Baumrind's (1996) theory of authoritative parenting styles. Characteristics of authoritative parenting include nurturance, communication, and the use of firm control. Compared to other types of parenting styles, fewer behavior problems occur with the use of authoritative parenting (Zisser & Eyberg, 2010). During CDI, PCIT draws heavily from attachment theory, which emphasizes the importance of sensitive and warm parenting to establish stable attachment and children's confidence that their needs will be attended to by their parent(s). A secure attachment parent-child relationship fosters social and emotional development (Ainsworth, 1989) and allows the child to feel secure in the parent-child

relationship (Coie et al., 1993). During PDI, PCIT emphasizes social learning theory, particularly Patterson's (1982) coercion theory in order to teach parents how to set limits for their child. This theory posits that challenging behaviors develop and continue to exist due to maladaptive parent-child interactions. These maladaptive interactions and behaviors occur as a result of the parental reinforcement of their child's challenging behaviors. Parent-Child Interaction Therapy is highly structured and employs the use of behavioral principles to increase appropriate behavior through reinforcement and shaping and decrease challenging behaviors through consistent consequences and setting limits (McNeil & Hembree-Kigin, 2010; Solomon et al., 2008).

**Structure.** The structure of PCIT is founded on the operant behavioral principals utilized in Hanf's (1969) two-stage parenting model. PCIT sessions occur weekly and last for about 1 hour. Each phase begins with a teach session involving only the parents and the therapist. During teach sessions parents actively participate and learn key treatment components using didactic presentation, discussion, modeling, and role-playing. Parents receive handouts at the end of teach sessions that describe basic techniques so that they may practice the skills prior to their next session. After the teach session, the parents attend numerous coaching sessions with their child until they reach criteria (Querido, Bearss, & Eyberg, 2002). During coaching sessions, the therapist observes, and codes parent's use of key skills then provide the parents with immediate feedback on the development of their skills. PCIT utilizes; therefore, parents progress through treatment as they master the key skills of each phase. (Eyberg & Funderburk, 2011).

***Child-Directed Interaction (CDI).*** Parent-Child Interaction Therapy begins with CDI in order to build a stable parent-child relationship (Ainsworth, 1989). During CDI, parents learn two parallel objectives: (1) improve the parent-child relationship through following the child's lead and (2) modify the child's behavior through selective attention (i.e., ignore undesired

behavior, redirect inappropriate activities, and provide attention to appropriate behaviors).

During this phase, the therapist teaches parents how to use positive parenting skills, known as the PRIDE skills – praise, reflection, imitation, description, and enjoy (Funderburk & Eyberg, 2011). As PCIT therapists coach the parents during CDI they apply differential social attention to shape parents’ use of the parenting PRIDE skills (Fernandez & Eyberg, 2005). Throughout this phase parents apply similar operant conditioning procedures to provide differential reinforcement of their child’s behavior, by applying the PRIDE skills to the child’s appropriate play and ignoring undesired behaviors. Through these procedures children acquire cooperation and social interaction skills (Fernandez & Eyberg, 2005). The therapist instructs parents to practice the PRIDE skills during special play with their child for 5 minutes each day at their home (Querido et al., 2002). Parents must reach mastery on the PRIDE skills by utilizing 10 labeled praises, 10 reflections, and 10 behavioral descriptions with three or less questions and commands during a 5-minute coding session. Once the parents achieve mastery criteria they progress to the PDI phase of treatment.

***Parent-Directed Interaction (PDI).*** The second phase of treatment, PDI, applies aspects of social learning theory and in order to increase children’s compliance with parental commands. During this phase, parents continue to reinforce children’s appropriate behaviors while learning how to provide effective commands and specific consequences for compliance and noncompliance (Querido et al., 2002). During PDI parents ignore mildly inappropriate behavior and utilize a step-by-step time-out procedure for severely inappropriate behavior. The two-stage time-out procedure emphasizes consistency, predictability, and follow-through. Time-out begins with a warning and may advance to a time-out chair for non-compliance and possible progression to the time-out room if the child leaves the chair. During PDI, parents must provide

direct commands with the appropriate follow-up sequence for 75% of commands given during a 5-minute coding period.

Parent-Child Interaction Therapy increases parents' use of positive parenting behaviors including reflective listening, praise, and descriptions of child appropriate behaviors and also decreases parents' negative physical and verbal behaviors towards the child during interactions. Parents demonstrated decreases in parenting stress, an improved internal locus of control, and high satisfaction with treatment (Nixon, Sweeney, Erickson, & Touyz, 2003; Schuhmann, Foote, Eyberg, Boggs, & Algina, 1998). Children demonstrate noticeable decreases in disruptive behaviors such as yelling, talking back, and whining, as well as marked increases in compliance to parents' directions (Eisenstadt, Eyberg, McNeil, Newcomb, & Funderburk, 1993; Eyberg, Funderburk, Hembree-Kigin, McNeil, Querido, & Hood, 2001). Research indicates that these changes generalize to untreated siblings (Brestan, Eyberg, Boggs & Algina, 1997) and to children's behavior in school (Funderburk et al., 1998). Families are considered for discharge when parents reach mastery on PDI skills and rate their child's behavior in a sub-clinical range ( $T$ -score < 60) on the Eyberg Child Behavior Checklist (ECBI; Eyberg & Pincus, 1999). The completion of treatment is considered a success and therefore attrition is considered a failure (Fernandez & Eyberg, 2005).

**Attrition in PCIT.** Most families who enroll in PCIT complete the treatment; however, a risk for attrition exists with any treatment. Approximately 28 to 50% of families participating in a form of parent training terminate their treatment early (Kazdin, Mazurick, & Siegel, 1994; Prinz & Miller, 1994). Gallagher (2003) reviewed PCIT outcomes in the current literature and found that the average rate of attrition for PCIT is 12.33% with a range of 0 to 53%. Overall, research suggests that PCIT attrition rates compare to other evidence based interventions for children

(Goldfine, Wagner, Branstetter, & McNeil, 2008). Werba, Eyberg, Boggs, and Algina (2006) examined PCIT success and attrition outcomes and found that 33% of families in PCIT terminated their treatment early. The researchers also found that wait-list status and maternal age strongly predicted treatment dropout prior to the start of treatment (Werba et al., 2006). In addition, both parental stress levels and inappropriate parenting behaviors (e.g., parental criticism, sarcasm) predicted dropout in families who started PCIT (Werba et al., 2006). More recently, Fernandez, Butler, & Eyberg, 2011) found attrition rates as high as 56%.

Harwood and Eyberg (2004) conducted a study that shifted from examining parent, child, and family characteristics to focus on therapy process variables in PCIT. The researchers found that therapists' use of a high rate of facilitative statements (e.g., Okay, Uh huh) with a low rate of close-ended questioning and supportive statements (e.g., "It seems like it has been hard to manage Sarah's behavior") predicted treatment success. In addition, results from Harwood and Eyberg's (2004) study demonstrated that therapist behaviors during 20 minutes of an assessment interview alone predicted treatment outcomes. This finding highlights the importance of therapists' efforts in establishing rapport with families during initial meetings. This study illustrates important relations between verbal behaviors used by PCIT therapists and treatment attrition versus completion (Harwood & Eyberg, 2004).

### **Impact of PCIT on Children with ASD**

Although PCIT was originally developed for typically developing children with externalizing behaviors, several studies have demonstrated its efficacy in reducing behavioral problems in more specialized populations. In the past, ASD cases were not considered for participation in PCIT due to its heavy emphasis on social contingencies such as verbal reinforcement, time-out, and ignoring (Masse, 2010). However, externalizing behaviors are often



the primary focus of treatment for most children with ASD and most parents desire to treat their child's aggression and non-compliance prior to treating other behaviors associated with ASD (Mandell, Walrath, Manteuffel, Sgro, & Pinto-Martin, 2005). Therefore, children with ASD are increasingly being referred to PCIT for treatment for behaviors typically targeted by PCIT such as noncompliance, inattention, and aggression (Mandell et al., 2005). The existing literature base consists of eight studies that examined the effectiveness of PCIT in reducing challenging behaviors exhibited by children with ASD. In the following sections the outcomes of each of these studies will be reviewed.

Solomon et al. (2008) conducted the first study examining the use of PCIT for youth diagnosed with ASD. The researchers recruited a sample of 19 males between ages 5 and 12 with clinically significant behavioral problems who met the following inclusion criteria: (a) met the DSM-IV-TR criteria for autistic disorder, autism syndrome, or PDD-NOS; (b) ASD or autism according to the Autism Diagnostic Observation Schedule-Generic (ADOS-G; Lord et al., 2000); and (c) autistic disorder according to the Autism Diagnostic Interview-Revised (ADI-R; Lord et al., 1994). The researchers utilized a wait-list control group design to form pairs of subjects matched with the same age, level of behavioral symptoms, and cognitive ability. One subject from each pair was randomly assigned to receive 12 PCIT treatment sessions. Results indicated that sub-clinical levels of ( $T$ -score  $< 60$ ) child problem behaviors on the Problem scale of the ECBI at the end of PCIT. However, ratings on the Intensity scale of the ECBI did not significantly decrease from pre- to post-treatment. Results also indicated that child functioning, as measured by the Behavior Assessment System for Children (BASC; Reynolds & Kamphaus, 1992) improved for the treatment group and parents rated their children as more "typical" on the Atypicality scale. In regard to parent perceptions of child behaviors, shared positive affect (SPA)

more than doubled from baseline to mid-point and parent positive affect significantly increased for the treatment group. Of note, the study did not include participants from the initial control group in the SPA measure. Limitations of this study include reliance on solely parent report measures, no formal measure of treatment fidelity, and a small sample size that limited the statistical power of analyses. This study demonstrated that PCIT improved the level of distress caused by challenging behaviors in older aged children with ASD and that traditional PCIT measures adequately evaluated the effectiveness of PCIT for this population.

Hatamzadeh, Pouretamad, and Hassanabadi (2010) conducted an A-B single-subject study that examined the use of PCIT with a sample of four young children between ages 3 and 7 with high functioning autism and clinically significant behavior problems. The four participants met the following inclusion criteria (a) met the DSM-IV-TR (APA, 2000) criteria for autistic disorder, (b) clinically significant scores ( $T$ -scores  $> 65$ ) on the ECBI (Eyberg & Pincus, 1999), and (c) full scale IQ scores  $> 70$  on a short form of the Wechsler Preschool and Primary Scale of Intelligence Revised (WPPSI-R; Wechsler, 1993). The ECBI was administered six times throughout the study to assess behavior problems at the following time points (a) 2 weeks prior to the intervention, (b) at the start of the intervention, (c) after CDI (d) after PDI, (e) 2 weeks post-intervention, and (f) 4 weeks post-intervention. Results indicated that all four children showed decreased trends on both ECBI scales with effect sizes ranging from 34% to 70% on the Problem scale and ranging from 19% to 39% on the Intensity scale. This study demonstrated that children with high functioning ASD decreased in behavioral problems following the implementation of PCIT.

Armstrong and Kimonis (2012) conducted a case study that examined the effectiveness of PCIT for a 5-year-old boy who met the DSM-IV-TR criteria for Asperger's, ODD, ADHD, and

OCD and exhibited associated behavior problems. Pre-treatment assessment revealed severe ASD symptoms in the child, as evaluated by the Gilliam Asperger's Disorder Scale (GADS; Gilliam, 2001). Over the course of the 16 treatment sessions, the DPICS-III (Eyberg, Nelson, Duke, & Boggs, 2005) and ECBI were used weekly to monitor progress. The child's mother and teacher completed pre-intervention measures 2 weeks prior to treatment and post-intervention measures at the last session and 3 months post-treatment. The child's mother and teacher rated aspects of the child's behavior using the Child Behavior Checklist (CBCL/TRF; Achenbach & Rescorla, 1991). At pre-treatment the child's *T*-scores indicated clinically significant risk for behavioral health problems, including: anxiety, affective problems, oppositional defiance, and pervasive developmental problems. Additionally, the child was in the borderline clinical range for attention deficit/hyperactivity problems. At follow-up, all scores except attention deficit/hyperactivity problems were rated in the normal range. In order to assess the intensity of disruptive behaviors and the raters' perceptions of problematic behavior the mother completed the ECBI weekly and teacher completed the Sutter-Eyberg Student Behavior Inventory-Revised (SESBI; Eyberg & Pincus, 1999) at the start of treatment, post-treatment, and at follow-up. At pre-treatment, the child's Intensity and Problem scores were significant on both the ECBI and SESBI. These scores declined at post-treatment and were no longer significant at follow-up. The declined ratings, as well as DPICS-III and parent interview data provide support for the effectiveness of PCIT at improving the parent-child relationship and treating a young child exhibiting behavioral problems associated with Asperger's and comorbid ODD, ADHD, and OCD. This case study also highlighted the importance of involving the child's teacher as much as possible in the treatment process. For example, in the present case study the researchers involved the child's teacher who agreed to send home a daily report card indicating whether he

had a good, okay, or difficult day and the child's mother created a reward chart that allowed the child to access privileges for his school behavior. If he had a difficult day at school his mother would tell him that tomorrow would be a new day and if he made good choices at school he could earn computer time. The researchers also provided the teacher with handouts on the use of praise to improve behavior. The child's teacher agreed to provide the child with more frequent and specific praise for his good behavior at school. The researchers emphasized the importance of involving the child's teacher in order to help generalize the child's improved behavior to the school environment.

Agazzi et al. (2013) conducted a case study that examined the efficacy PCIT for a 7-year-old boy with ASD and associated behavioral problems. The child received an ASD diagnosis, as well as other comorbid disorders such as, ODD, primary insomnia, stereotypic movement disorder, and intellectual disability. Assessment conducted prior to the treatment indicated severe symptoms of ASD, as evaluated by parent ratings on the Child Autism Rating Scale-Second Edition (CARS-2; Schopler, Van Bourgondien, Wellman, & Love, 2010). The ECBI was completed before, during, after, and at 3 months post treatment in order to examine the efficacy of the treatment (Agazzi et al., 2013). At the start of treatment, the child's parents qualitatively reported extremely disruptive behaviors. However, both parents rated his behavior as only slightly elevated for Intensity scale (e.g., mother's rating:  $T$ -score = 60, father's rating:  $T$ -score = 65) and in the normal range on the Problems scale (e.g., mother's rating:  $T$ -score = 55, father's rating:  $T$ -score = 51). Over the course 15 weeks of treatment, the parents' ratings on the Intensity and Problem scales of the ECBI scales decreased, except for the final three sessions. The therapists hypothesized that holiday stress and stress associated with the implementation of a new sleep routine may have contributed to increased scores the last three weeks of treatment. At

follow-up, the father reported lower ratings, but the mother's ratings increased for the Intensity (e.g., mother's *T*-score = 61, father's *T*-score = 42) and Problem scales (e.g., mother's *T*-score = 56, father's *T*-score = 45). Parents reached mastery on CDI PRIDE skills, as measured weekly by the DPICS-III. Despite increased ECBI scores for the last three sessions, decreases in the child's aggression, behavioral outbursts, and repetitive motor behaviors occurred throughout the course of treatment. These overall decreases combined with parent interview data suggested that PCIT effectively decreased the behavior problems in a 7-year-old boy with ASD. This case study also noted the importance of the therapist's flexibility and creativity throughout the course of treatment with the maintenance of fidelity. For example, the therapists spent extra time with the family before, during, and after the sessions to develop and maintain rapport with the family. The therapists also allowed the parents to bring in toys that interested the child due to his disinterest in the toys provided at PCIT. Additionally, although the child's behaviors improved in the home environment, they did not generalize to the school environment. The researchers' unsuccessful attempts to engage staff members at the child's school likely contributed to the lack of generalization to the school environment. The researchers recommended that in the future, clinicians attempt to involve school personnel in order to extend appropriate behavioral expectations across settings.

Lesack and colleagues (2014) conducted a case study that assessed the effectiveness of PCIT with modifications for a 5-year old male with ASD referred to PCIT for problem behaviors including noncompliance, self-injury, aggression, and dangerous behaviors (e.g., playing with light bulbs, elopement, climbing on appliances and counters). The child received an ASD diagnosis according to DSM-V diagnostic criteria (APA, 2013) collected through clinical interview and behavioral observations. Clinical observations also revealed significant expressive

and receptive language delays. Due to the child's level of expressive communication, therapists employed adapted procedures during both phases of treatment. During CDI, adapted use of reflections included: (a) only reflect vocalizations with apparent and appropriate communicative intent followed by the word(s) associated with action(s) or item(s) (e.g. "Ah, you said block"), and (b) ignore stereotypic vocalizations. Also, due to the child's receptive language delays, adaptations to PDI procedures were made in order to increase the child's understanding of commands including: (a) say the child's name as a prompting cue before giving a command, (b) introduce target commands with three-step prompting (i.e., verbal, model, physical), (c) use a gestural cue for commands (e.g., pointing), and (d) target commands must be complied with three consecutive times prior to introducing time-out. Additionally, the adaptations to the time-out procedures during PDI included: (a) reduced time-out procedure from 3 minutes and 5 quiet seconds to 1 minute and 2 quiet seconds; (b) limited use of time-out applied exclusively for two commands identified as safety concerns by the mother, as well as for aggression and/or intense disruptions; and (c) use of a holding chair instead of the time-out room. Over the course of 22 treatment sessions, the DPICS-III and the ECBI were used to monitor progress. At pre-treatment, the ECBI scores were in the clinically significant range ( $T$ -score = 68) and increased by the second CDI session ( $T$ -score = 71). This temporary increase prior to a decrease in problematic behavior, known as an "extinction burst," commonly occurs during the first few weeks of PCIT. Over the course of treatment, ECBI scores declined to subclinical levels ( $T$ -score = 53). The decline in ECBI scores, parents' mastery of PRIDE skills, and increased compliance at home and in the clinical setting demonstrate the successful implementation of an adapted format of PCIT for a child with ASD and severe developmental delays. These findings reflect the success of

various modifications to the format of PCIT for children with ASD and provide support for the expansion of PCIT to children diagnosed with ASD and severe developmental delays.

Armstrong, DeLoatche, Preece, and Agazzi (2015) conducted a case study that assessed the effectiveness of PCIT combined with visual supports for a 5-year-old female diagnosed with ASD, moderate intellectual disabilities, and comorbid epilepsy. She was referred to PCIT for challenging behaviors that she exhibited across settings and caregivers including non-compliance, screaming, and aggression (i.e., hitting, hair pulling, pinching, biting). Due to the child's moderate intellectual disabilities and limited communication and interaction abilities, visual supports were added to ensure the child understood the behavioral expectations taught in PCIT. The adaptations made to PCIT included the use of a visual schedule of the bedtime routine and a social story to teach the child the discipline sequence during PDI. Over the course of 10 treatment sessions, the DPICS-III, ECBI, and SESBI-R were administered weekly to monitor progress. At pre-treatment, Intensity scale scores as rated by parents on the ECBI ( $T$ -score = 69) and by the teacher on the SESBI-R ( $T$ -score = 75) were clinically significant. In addition, the CBCL and TRF were administered 2 weeks prior to treatment, at the last session, and 5 months post treatment. Pre-treatment parent and teacher ratings on the CBCL and the TRF indicated clinically significant scores on DSM-Oriented Scales for Affective Problems, Oppositional Defiant Problems, Attention Deficit/Hyperactivity Problems, and Pervasive Developmental Problems. Over the course of treatment, the child's scores on all rating scales declined. Specifically, parent ECBI scores declined to the average range for both the Intensity and Problem scales ( $T$ -score = 47). Teacher SESBI-R scores declined but the Intensity scale score was still elevated ( $T$ -score = 63). Similarly, on the CBCL and TRF parents endorsed subclinical scores on the CBCL for Affective Problems, Oppositional Defiant Problems, and Anxiety

Problems while the teacher's ratings declined but remained in the clinical range for Affective Problems, Oppositional Defiant Problems, and Pervasive Developmental Problems. Teacher ratings of Anxiety Problems and Attention Deficit/Hyperactivity Problems remained unchanged. In sum, this case study supports the effectiveness of PCIT combined with VS as a treatment for a child with combined ASD, ID, and epilepsy as demonstrated by decreased ratings on the ECBI, SESBI-R, CBCL, and TRF. In addition, the child demonstrated improvements in functional play skills and increased attention, and more importantly, her parents reported that they were able to enjoy everyday outings (e.g. restaurants, stores). These findings reflect the successful incorporation of visual supports such as schedules and social stories for children with ASD and limited communication abilities.

Knap (2015) utilized data from a larger study conducted by Agazzi et al. (2015) that examined the effect of PCIT on reducing maternal stress and symptoms of anxiety and depression in order to examine the effectiveness of PCIT in improving the behavioral outcomes in four young children with ASD. Specifically, Knap (2015) employed a non-concurrent multiple baseline design to examine the effect of PCIT on the frequency and severity of young children's challenging behaviors, mothers' positive parenting practices, and mothers' satisfaction with treatment. Participants included four mothers and their young children with ASD. Mothers had elevated stress scores ( $T\text{-score} \geq 90$ ) on the Parenting Stress Index-4<sup>th</sup> edition (PSI-4; Abidin, 2013) and had a mean age of 38.25 with a standard deviation of 6.02. The two male and two female children were between the ages of 2 and 7 ( $M = 5.88$ ,  $SD = 1.67$ ) and demonstrated clinically significant scores ( $T\text{-score} \geq 60$ ) on the ECBI and CBCL. Outcome measures included the ECBI, CBCL, DPICS-IV, and the TAI. Results indicated that children's challenging behaviors declined in frequency and severity after the completion of PCIT; however, these



decreases were not statistically significant. In addition, mothers improved on all parenting practices including behavior descriptions, reflections, and labeled praise. Mothers who participated in the study conveyed high levels of satisfaction with PCIT and reported improvements in their relationship with their child, as well as in their child's compliance and major behavior problems. The researchers utilized adaptations for one of the children in the study with low expressive and reflective language skills. For this child, the researchers employed the same adaptations used by Lesack and colleagues (2014) for CDI reflection procedures, PDI direct command procedures, and the use of a time-out holding chair in place of the time-out room. However, the researchers utilized different adaptations for PDI time-out procedures including (a) time-out lasted 25 seconds and 5 quiet seconds, (b) time-out holding chair lasted 10 seconds and 5 quiet seconds with an alternative option of returning the child to the time-out chair with no verbal or non-verbal attention from the parent. This study demonstrated that PCIT improves mothers' parenting practices and that mothers of children with ASD consider PCIT to be a highly satisfactory treatment.

Most recently, Masse, McNeil, Wagner, & Quetsch (2016) conducted a single subject, non-concurrent multiple baseline design study with three parent-child dyads that examined the efficacy of PCIT as a treatment for children with ASD. Specifically, Masse and colleagues (2016) examined the impact of PCIT on participating children's compliance rates, parent report of children's oppositional behaviors, positive parenting behaviors, and parents' satisfaction with treatment. In addition, Masse and colleagues (2016) examined the effect of PCIT on ASD behaviors. The three participants met the following inclusion criteria: (a) child was between 2 and 7 years old, (b) participating caregiver was the child's primary and legal guardian, (c) child was previously diagnosed with ASD and identified as having significant compliance issues, and

(d) child had receptive language skills greater than 24 months, as measured by the Peabody Picture Vocabulary Test-III (PPVT-III; Dunn and Dunn, 1997). Results from the study indicated that children's compliance increased, and their disruptive behavior decreased. Participating caregivers demonstrated improved parenting skills and reported high levels of satisfaction with treatment. The results of this study provide evidence for the effectiveness of PCIT as a treatment option for children diagnosed with ASD whom exhibit challenging behaviors.

The eight studies reviewed in this section provide preliminary evidence for the effectiveness of PCIT for children with ASD. These studies contribute to the research in multiple ways but are not without limitations. The four case studies provided in-depth information regarding specific considerations for the use of PCIT with children with ASD. Specifically, the studies indicated that clinicians should maintain fidelity but allow some flexibility and/or incorporate adaptations in treatment because of the unique complicating factors and behavioral problems associated with young children with ASD (Agazzi et al., 2013; Armstrong & Kimonis, 2012; Armstrong et al., 2015; Lesack et al., 2014). The existing studies also highlighted the importance of building rapport and working closely with families. Of note, only one study exists with a wait-list control design and random assignment, but it included older children with ASD (Solomon et al., 2008); therefore, a major limitation of the current literature base pertains to the lack of studies with rigorous design.

### **Purpose of the Present Study**

Research indicates the severity of challenging behaviors such as aggression and destruction increase with age and that if left untreated these behaviors persist into adulthood (Fodstad Rojahn, & Matson 2012; Murphy et al., 2005). Early intervention can improve the adaptive abilities of children with ASD and make development more typical for them, thus

reducing ASD symptoms (Beauchaine & Hinshaw, 2013). Therefore, it is imperative to provide treatment to children with ASD and their families in order to optimize the outcomes for these children. Well-established treatments for children with ASD rely on a behavioral model and include a strong parent involvement component (Drew et al., 2002; Koegel, O'Dell, & Koegel, 1987; Lovaas, 1987, 1993; Solomon, Goodlin-Jones, & Anders, 2004). Parent-Child Interaction Therapy is an empirically supported intervention with a strong parent involvement component for the treatment of challenging behaviors in young children that incorporates characteristics of successful therapies utilized for children with ASD. The present study examined how stable patterns of challenging behaviors, ASD symptoms, and expressive communication were in young children with ASD who were enrolled in PCIT. The study also examined barriers to treatment participation for children with ASD and their families. Specifically, the study gathered data to examine the perceptions of parent participants whom discontinued treatment. The results of this study contribute to the existing literature base investigating treatment options for children with ASD and their families. It also expands on the current literature base focused on the implementation of PCIT for specialized populations, as well as barriers to implementation of PCIT.

### **Chapter Three: Research Methods**

This chapter describes the research methods of the current study. This chapter will begin with a discussion of the study participants, including a discussion of recruitment procedures, inclusion and exclusion criteria, and ethical considerations. The next section will describe the setting, followed by a detailed explanation of the intervention under study. The measures will be described next, followed by the research design and procedures utilized in the present study. The chapter concludes with a review of the data analyses that were conducted in order to address the research questions of the study.

#### **Participants**

Three parent-child dyads met the study inclusion criteria and provided informed consent to participate in the study. Child participants included two females and one male ranging in age from four to six-years old. Dyad 1 included a female elementary-age child and her biological father. Dyad 2 included a female pre-school-age child and her biological mother. Dyad 3 included a male pre-school age child and his biological mother. It is important to note that the child participants in Dyad 2 and Dyad 3 were twins; therefore, the parent participant was the same mother in both Dyad 2 and Dyad 3. Participants were established university health clinic patients with referrals for PCIT services.

**Recruitment procedures.** Participants were recruited from a list of established university health clinic patients referred to receive PCIT services. These children were evaluated by a university healthcare professional and referred internally for participation in PCIT services. Families referred for PCIT services are placed on a wait-list to receive PCIT services. After

obtaining IRB approval, reviews of the wait-list for families referred to PCIT took place to screen for potential participants. If the preliminary criteria were met, the family was contacted by mail to provide them with information about the study in order to determine their interest in participating in the study. Parents were provided with the primary investigator's phone number and email address, so they could contact the PI if they were interested in participating in the study. All potential participants were informed that they could still receive standard PCIT services if they did not wish to participate in the study and would maintain their current status on the wait-list.

**Inclusion/exclusion criteria.** In order to participate in the present study, child and parent participants had to meet specific inclusion criteria. Children participants were screened to ensure they met the following inclusion and exclusion criteria for the study. Participating children needed to be between the ages of 2 years and 6 years, 11 months. Children must have an established diagnosis of ASD based on DSM-5 criteria made by a qualified practitioner. Their caregiver was asked to provide documentation of their child's ASD diagnosis (e.g., signed medical or psychological report). Children were excluded if they were receiving concurrent intensive behavioral intervention services, such as applied behavior analysis (ABA) therapy. Children who were not living with their biological or adoptive parent at the time of screening were excluded, as well as children not living with their biological or adoptive parent for at least 6 months. Children must have exhibited clinically significant levels of challenging behaviors as rated by their parents at a stage-2 screening session using the ECBI ( $T$ -score  $\geq 60$ ). Children needed to have receptive language skills greater than or equal to 24 months on a psychological or a speech/language evaluation. If children had recently undergone a cognitive or speech/language evaluation, then the results from that evaluation were used to document their receptive language

skills. Otherwise, the primary investigator administered the Auditory Comprehension (AC) scale of the Preschool Language Scales-Fourth Edition (PLS-4; Zimmerman, Steiner, & Pond, 2002) to determine the child's receptive language skill level.

Participating parents needed to speak fluent English. Parents needed to have access to reliable transportation to attend treatment sessions. Parents needed to be at least 18 years of age. Parents who verbally endorsed having physical impairments (e.g., blindness, deafness) were excluded from the study, as they would not have been able to participate in required activities of PCIT, such as describing their child's behavior, following their child's play behaviors, physically moving their child if necessary. Parents who verbally endorsed having cognitive impairments (e.g., learning information, remembering detailed information) were excluded, as they would not have been able to participate in the required activities, such as following in-vivo coaching from the therapist and understanding and applying PCIT skills. Only three parents expressed interest in the present study and all three parents met the inclusion criteria and were recruited for participation in the present study.

**Participant attrition.** Three parent-child dyads met the inclusion criteria described above and were recruited for the study. Dyad 1 withdrew from the study after three weeks of baseline and four weeks of intervention due to stress with scheduling and other personal matters. Dyad 1 reported that they dropped out due to "thing being hectic at home." Dyad 2 discontinued treatment after seven weeks of baseline. Dyad 3 completed 5 weeks of baseline and the CDI teach session. Because the mother became was experiencing health related complications, the father, whom was not the enrolled parent participant attended two treatment sessions with the Dyad 3 child, during which only standard PCIT measures were collected. Dyads 2 and 3 discontinued treatment due to health complications that their mother was experiencing. Table 2

describes the demographic information for the three children who participated study and Table 3 summarizes their caregivers' demographic information.

Table 2

<i>Child Demographic Information</i>	
Variable	Child (n = 3)
Gender	
Male	1
Female	2
Average Age	4.67
Race/Ethnicity	
African American/Black	0
Caucasian/White	1
Hispanic/Latino	0
Asian/Asian Indian	0
Native Hawaiian/Pacific Islander	0
Multi-Racial	2
Other	0
Outside Therapies/Services	
Speech/Language Therapy	2
Special Education Services (School IEP)	3
Type of Daycare Program/School	
Preschool	2
Elementary School	1

**Protection of human subjects.** Parents who met the inclusion criteria and expressed interest in participating in the study signed the informed consent form (see Appendix A). All computer-generated data was stored in password limited network drive files. All paper-generated data was kept by the primary investigator in a locked file cabinet at the Silver Center located in the Department of Psychiatry and Behavioral Neurosciences at the University of South Florida. All dyads were assigned a code number. Code numbers were used on data-collection tools in order to maintain confidentiality of participant names and other identifying information. A record file containing the code numbers associated with study participants was maintained in a

separate locked file stored separately from the other study information. All study data will be destroyed five years after the submission date of the study report. Given the significant attrition rate in the present study of 100%, an IRB amendment was submitted. This amendment involved the application to collect more data regarding participants' experiences regarding their barriers to treatment participation.

Table 3

<i>Caregiver Demographic Information</i>	
Variable	Caregiver (n = 2)
Relation to Child	
Biological Mother	1
Biological Father	1
Marital Status	
Married	2
Employment Status	
Employed	0
Not Employed	2
Average Age	41
Race/Ethnicity	
African American/Black	0
Caucasian/White	1
Hispanic/Latino	0
Asian/Asian Indian	0
Native Hawaiian/Pacific Islander	0
Multi-Racial	1
Other	0
Highest Level of Completed Education	
Two-Year College Degree	1
Four-Year College Degree	1
Number of Adults in Home	
Two or More	2
Number of Children in Home	
Two	2



## **Setting**

In the present study, PCIT was provided at the USF Silver Child Development Center. This clinic provides a variety of services for children ranging in ages from birth to 12-years-old, including: (a) behavioral and developmental screenings and evaluations; (b) neurocognitive and psycho-educational evaluations; and (c) behavioral consultation, intervention, and treatment. Common referral concerns to the clinic include noncompliance, aggression and/or destruction, ASD, inattention and/or hyperactivity/impulsivity, disruptive behavior, and academic difficulties. Families referred to the Silver Child Development Center for services, including PCIT, typically pay for services through their medical insurance.

## **Parent-Child Interaction Therapy**

**Description of treatment sessions.** The procedures described in the PCIT manual (Eyberg & Funderburk, 2011) were followed throughout the course of the intervention. The sessions occurred weekly for approximately 1 hour. The PI served as the PCIT therapist for all three parent-child dyads enrolled in the study. One other research personnel member assisted with the data collection procedures of the present study. All research personnel held current PCIT therapist certifications and were the only personnel interacting with research participants. All research personnel were school psychology doctoral candidates at the local university.

There are two phases of PCIT, CDI and PDI, both which begin with a teach session. Due to participant attrition, none of the parent-child dyads made it to the PDI phase of treatment; therefore, PDI procedures will not be described because they were not delivered in the current study. During each of the CDI teach session, the therapist discussed and demonstrated the skills for the phase. Teach sessions are held without the child so that the therapist can teach the child's parents the skills associated with the phase. During teach sessions, the therapist reviews and then

models the skills and procedures with the parent, then engages in a role-play of the skills with the parent. In the present study, participants withdrew from treatment before the second phase of treatment; so they only participated in the CDI teach session. Table 4 provides an overview of the course of PCIT sessions.

Table 4

*Overview of PCIT Sessions*

Session	Goals	Approximate Length
Pre-Treatment Assessment	<ul style="list-style-type: none"> <li>- Assess appropriateness of PCIT for the family</li> <li>- Establish rapport with the family</li> <li>- Collect baseline data</li> </ul>	1 session
CDI Teach	<ul style="list-style-type: none"> <li>- Establish rapport with the family</li> <li>- Educate parents about procedures and course of therapy</li> <li>- Teach parents CDI skills</li> <li>- Provide rationale for each skill tailored to the family</li> </ul>	1 session
CDI Coaching	<ul style="list-style-type: none"> <li>- Strengthen rapport with the family</li> <li>- Stress the importance of regular homework completion</li> <li>- Build parents' confidence and shape their use of CDI skills</li> <li>- Achieve mastery of CDI skills</li> </ul>	5-6 sessions
PDI Teach	<ul style="list-style-type: none"> <li>- Teach steps of PDI procedure</li> <li>- Provide rationale for steps so parents understand importance of following exact procedures</li> <li>- Explain gradual progression of PDI commands (shift from play to real life commands) in treatment</li> </ul>	1 session
PDI Coaching	<ul style="list-style-type: none"> <li>- Parents coached in correct implementation of PDI with child</li> <li>- Parents learn to implement PDI procedure at home</li> <li>- Achieve mastery of PDI skills</li> </ul>	5-6 sessions
Post-Treatment Assessment/ Graduation	<ul style="list-style-type: none"> <li>- Collect post-treatment data</li> <li>- Review treatment progress and success</li> <li>- Plan for future maintenance of treatment gains</li> </ul>	1 session

*Note.* Adapted from "Parent- Child Interaction Therapy Protocol" by S.M. Eyberg and B.W. Funderburk, 2011. Copyright 2011 by Parent-Child Interaction Therapy International.

All coaching sessions were held with the parent and their child, during which the therapist coached the parent on their use of the positive parenting behaviors skills. Coaching

session began with a brief discussion with the child's parent(s). During this time, the therapist spent 1 to 3 minutes addressing parents' stressors unrelated to their child's behavior in order to provide the parents with some support. Following this discussion, the therapist spent 5 to 10 minutes reviewing the parents' homework sheets and provided them with feedback and advice as needed. Following the brief discussion, the therapist observed and coded the parents' interactions with their child. During each CDI coaching session, CDI skills were observed and coded for 5 minutes using the DPICS-IV (Eyberg et al., 2013). Children's expressive communication skills were also recorded for 5 minutes during each session.

**CDI skills.** In the CDI phase of PCIT, parents were taught positive parenting behaviors to use during special play with their child. These parenting skills are referred to using an acronym called PRIDE, which includes the following skills: praise, reflection, imitation, description, and enjoy (Eyberg & Funderburk, 2011). Table 5 provides detailed descriptions, reasons for use, and examples of each of the PRIDE skills taught to parents in PCIT. Table 6 describes the verbalizations that parents should avoid during the CDI phase of PCIT. Finally, Table 7 describes how parents should handle their child's misbehavior during CDI. In PCIT, parents progress to the PDI phase of PCIT when they reach mastery of the skills described in Table 5. CDI mastery criteria requires parents to use 10 labeled praises, 10 reflections, and 10 behaviors descriptions with less than three questions and commands during a 5-minute DPICS-IV coding observation.

Table 5

*Parent CDI Skills*

Skill	Definition	Reasons	Examples
Labeled Praise	Specific compliment about child's behavior	Increases the praised behavior Indicates approval Improves child's self esteem Makes child feel good	"You drew a pretty butterfly" "Good job putting the blocks away"
Reflection	Repeat or paraphrase child's talk	Lets child lead the conversation Indicates interest Shows understanding and acceptance Improves child's speech Increases child's verbal communication	Child: "I drew a butterfly" Parent: "Yes, you did draw a butterfly"
Imitate	Copy child's play	Lets child lead Indicates approval of child's play Makes the game exciting for child Increases child's imitation of parent's actions Teaches child how to take turns and play well with others	Child: (building a tower) Parent: "I am building a red tower just like you"
Behavior Description	Describe child's current activity	Lets child lead Indicates parent's interest Teaches child concepts Models appropriate vocabulary and speech Holds child's attention on tasks Organizes child's thoughts about the activity	"You're making a tower" "You drew a circle"
Enjoy	Act happy and warm with child during play	Shows the child that the parent is enjoying time with them Adds to warmth of play Increases closeness between parent and child	Child: (carefully placing a red block on a tower) Parent: (gently touching child's back) "You are being so gentle with the toys"

*Note.* Adapted from "Parent- Child Interaction Therapy Protocol" by S.M. Eyberg and B.W. Funderburk, 2011. Copyright 2011 by Parent-Child Interaction Therapy International.

Table 6

*Parent Verbalizations to Avoid During CDI*

Verbalization	Definition	Reason	Example
Commands	Tells child to do something	Takes lead away from child Can cause conflict	Indirect Command: "Let's play with the blocks next" Direct Command: "Give me the blue block"
Questions	Requires child to give an answer	Leads the conversation Many questions require an answer and are commands May seem like parent is not listening or disagrees	"We're building a tower, aren't we?" "You're using a blue block?"
Criticism and Sarcasm	Expresses disapproval of child	Gives attention to negative behavior Lowers child's self-esteem Causes angry feelings between parent and child Teaches child negative social behavior	"That wasn't a good idea" "I don't like your whining"

*Note.* Adapted from "Parent- Child Interaction Therapy Protocol" by S.M. Eyberg and B.W. Funderburk, 2011. Copyright 2011 by Parent-Child Interaction Therapy International.

**Adaptations.** Although PCIT has recently been used for children with ASD, concerns exist regarding the prominence of the use of social reinforcement in PCIT, such as parent(s) attention during CDI, to motivate children's pro-social behaviors. In addition, questions arose pertaining to the ability of children with severely compromised language skills (i.e., lower than 24 months of age; Masse, 2010) to comprehend commands during PDI. Currently, the research base lacks published guidelines and/or descriptions on how to adapt PCIT to accommodate children with ASD and severe developmental delays such as limited receptive and expressive communication while adhering to the core intervention components. When considering utilizing PCIT for children with ASD, therapists must determine what curriculum changes, if any are required (Lesack et al., 2014). According to Eyberg (2005), all PCIT cases involve tailoring,

which refers to changes in the delivery style or focus of fundamental elements of the treatment in order to meet a family’s specific needs. While adaptations involve changes in the structure and content of treatment in order to use the treatment with a given population or situation (Funderburk, Ware, Altshuler, & Chaffin, 2008). In the present study, PCIT was delivered according to the recent version of the PCIT manual (Eyberg & Funderburk, 2011). Adaptations to PCIT procedures were not necessary for the participants in the present study. If adaptations were required, the study planned to follow the adaptations utilized by Lesack et al. (2014) for children with limited expressive and receptive language skills (see Table 8).

Table 7

*Parent Handling of Challenging Behaviors During CDI*

Handling Problems	Definition	Reason	Example
Ignore minor misbehavior	Look away Show no expression Say nothing to child Praise child’s first positive behavior	Helps child notice the difference between parents’ responses to positive and negative behavior Consistent ignoring reduces child’s attention-seeking behavior	Child: (carefully coloring) “My drawing is better than your ugly drawing” Parent: (ignores rude talk) “I like how carefully you’re coloring”
Stop the play for destructive and aggressive behavior	Immediately end the play Tell the child special play is over because of their aggressive and/or destructive behavior	These behaviors cannot be ignored because they can be dangerous	Child: (hits parent) Parent: (gathering toys) “Special time is over because you hit me” Child: “No, no, no mom. Please, I’ll be good. I’m sorry” Parent: “Special time is over today. We will play again tomorrow”

*Note.* Adapted from “Parent- Child Interaction Therapy Protocol” by S.M. Eyberg and B.W. Funderburk, 2011. Copyright 2011 by Parent-Child Interaction Therapy International.

Table 8

*Summary of Adaptations to PCIT*

PCIT Phase	Adapted Procedure	Description of Adaptations
CDI	Reflections	(a) Only reflect vocalizations with apparent and appropriate communicative intent followed by the word(s) associated with action(s) or item(s) (e.g. “Ah’, you said block”) (b) Ignore stereotypic vocalizations
PDI	Direct Commands	(a) Say the child’s name as a prompting cue before giving a command (b) Introduce target commands with three-step prompting (i.e., verbal, model, physical) (c) Use a gesture cue for commands (e.g., pointing) (d) Target commands must be complied with three consecutive times prior to introducing time-out
	Time-Out	(a) Reduced time-out procedure from 3 minutes and 5 quiet seconds to 1 minute and 2 quiet seconds that increases with child’s successful sitting compliance (b) Use of a holding chair for 30 seconds and 5 quiet seconds as a back-up procedure instead of the time-out room

*Note.* Adapted from “Parent-Child Interaction Therapy and Autism Spectrum Disorder: Adaptations with a Child with Severe Developmental Delays,” by R. Lesack, K. Bearss, M. Celano, and W.G. Sharp, 2014, *Clinical Practice in Pediatric Psychology*, 2(1), 68.

**Research Design**

The present study employed a non-concurrent multiple baseline single case design. This design involved the collection of baseline data prior to the introduction of the intervention phase to different participants at different times (i.e. staggering). The staggering of intervention start points is methodologically rigorous in identifying changes in the dependent variable as a result of the intervention and not as a result of other confounding factors such as history or maturation (Kratochwill & Levin, 2010). A multiple baseline design was considered to be the most ethically appropriate design for the present study, as it does not involve the withdrawal of a potentially

beneficial intervention (i.e., ABAB design). Furthermore, this design was appropriate because PCIT involves teaching skills to parents and children which cannot be removed or reversed.

## **Measures**

Data collection occurred during three stages in the present study including screening, baseline, and treatment. Single-case design standards state that variables should be measured continuously using direct observation and supported with rating scales. Therefore, systematic direct observations were conducted continuously during baseline and treatment. In addition, psychometrically sound rating scales were administered throughout baseline and treatment phases. Finally, PCIT intervention fidelity data was gathered to examine treatment integrity.

**Screening measures.** In order to determine if participants met the inclusion criteria of the study, various screening measures were administered to determine if child participants met the inclusion/exclusion criteria for the study. These measures included the Auditory Comprehension Scale of the PLS-4, if a measure of receptive language skills was needed, and the ECBI. The ECBI additionally served as an outcome measure and will be described in the following section.

**Demographic questionnaire.** The principal investigator created a demographic questionnaire with separate sections to gather demographic data for child and parent participants (see Appendix D). The demographic questionnaire collected parent information including name, age, date of birth, race/ethnicity, marital status, highest level of education, employment status, relationship to the child, number of other caregivers in the home, and number of other children in the home. Child demographic information included the child's name, age, birth, race/ethnicity, involvement in other therapies/services, and school/daycare enrollment.

**Preschool Language Scale – Fourth Edition (PLS-4).** The PLS-4 (Zimmerman, Steiner, & Pond, 2002) is an interactive and comprehensive assessment used to assess developmental



language skills in children from birth to 6 years and 11 months of age. The PLS-4 takes between 20 and 45 minutes to administer. Norms are provided for Total Language, Standard Scores, Percentile Ranks, and Language Age Equivalents. The PLS-4 also yields norms for two standardized scales: Auditory Comprehension (AC) and Expressive Communication (EC). The AC scale includes subtest items that examine different aspects of receptive language including play, attention, and gesture. The EC scale includes subtest items that assess social communication, vocal development, vocabulary, language structure, concepts, phonological awareness, and integrative language skills. The AC scale of the PLS-4 was administered to child participants without documentation of their receptive language skills. Acceptable forms of documentation for children's receptive language skills included previous evaluations conducted by a professional such as a prior speech or psychological evaluation. If children did not have existing documentation of their receptive language skills, then the primary investigator administered the PLS-4 to children at the stage-2 screening session to ensure that child participants had the receptive language skills ( $\geq 24$  months) necessary to participate in treatment. The PLS-4 yields stronger psychometric data compared to the PLS-5, which is why it will be utilized in the present study.

The PLS-4 was standardized with 1,564 children, including children with disabilities, from birth through 6 years and 11 months of age (Zimmerman, et al., 2011). The internal consistency reliability coefficients for the AC scale ranged from .66 to .94 with an overall of .86. Internal consistency reliability coefficients for the EC scale ranged from .73 to .94 with an overall of .91. The Composite score internal consistency reliability coefficients ranged from .91 to .97 with an overall of .93. Test-retest reliability coefficients for subscale scores ranged from .82 to .95 and .92 to .97 for the Total Language Score. Inter-rater reliability was examined by

selecting 100 protocols from the standardization sample. Fifteen individuals scored the EC subtest of the selected protocols and two different individuals scored each protocol. The percentage of agreement between scorers was 99% and the correlation between EC scores was .99. The correlation between the AC and EC scales across ages was .80. Concurrent validity with the Denver-II (Frankenburg et al., 1992) and PLS-4 was evidence by Denver-II outcomes and scores within 1 standard deviation on the PLS-4. Additionally, correlations with the PLS-3 and PLS-4 were .65 for the AC scale and .79 for the EC scale. Evidence for construct validity was demonstrated by a correlation of .74 between the AC and EC scales of the PLS-4, which both claim to measure different aspects of language ability.

**Outcomes measures.** Throughout the baseline and treatment phases, numerous dependent variables were examined. Parent participants completed weekly measures to assess their child's challenging behaviors, and ASD symptoms. The PI conducted systematic direct observations each session in order to measure parents' parenting practice and children's expressive communication.

***Eyberg Child Behavior Inventory (ECBI).*** The ECBI (Eyberg & Pincus, 1999) is an empirically supported, 36-item parent report measure of their child's disruptive behavior that is appropriate for use with children between ages 2 and 16. The Intensity scale measures the frequency of a child's disruptive behaviors on a 7-point Likert scale ranging from 1 (i.e., never) to 7 (i.e., always). In addition, the scores obtained from the Intensity scale provide a measure of the child's improvement throughout treatment. The Problem scale examines parents' tolerance and distress level associated with their child's disruptive behaviors using a yes-or-no format for parents to indicate whether or not the behavior is a problem. Clinical cut-off scores for the Intensity scale are 131 ( $T$ -score  $\geq 60$ ) and 15 ( $T$ -score  $\geq 60$ ) for the Problem scale (Eyberg &

Pincus, 1999). Both scales demonstrate sensitivity to behavioral changes that occur during therapy, making the ECBI an appropriate measure for monitoring treatment effects (Eyberg & Robinson, 1983). Example items include “has temper tantrums,” and “refuses to obey until threatened with punishment.”

The ECBI was restandardized using a sample of 798 children between ages 2 and 16 (Eyberg & Pincus, 1999). The Problem and Intensity scales of the ECBI have high internal consistency with coefficients of .95 and .93. Test-retest reliability coefficients over 12 weeks were .80 for the Problem scale and .85 for the Intensity scale and over 10 months the coefficients were .75 for both scales (Funderburk, Eyberg, Rich, & Behar, 2003). High construct validity has been established for the ECBI. In particular, it has high correlations with the Externalizing scale of the CBCL with correlations of .85 for the Problem scale and .86 for the Intensity scale (Boggs, Eyberg, & Reynolds, 1990). Discriminant validity is demonstrated by the significant differences between the correlations with the Internalizing and Externalizing scales of the CBCL (Boggs et al., 1990).

***Dyadic Parent-Child Interaction Coding System – Fourth Edition (DPICS-IV).*** The DPICS-IV (Eyberg et al., 2013) is a structured behavioral coding system used to measure parents’ use of PCIT skills in a 5-minute coding period and to make decisions about progression during PCIT (Eyberg et al., 2013). The therapist conducts the observation, which measures both parent and child behaviors. Specifically, it measures a variety of parent behaviors including (a) the frequency of labeled praise (e.g., “I like it when you sit quietly.” and unlabeled praise (e.g., “Good job!”), which are statements that express positive evaluation towards the child, (b) behavior descriptions which describe the child’s actions, (c) reflections which entails rephrasing the child’s verbalizations, (d) direct (e.g., “Sit down.”) and indirect commands (e.g., “Would you

like to sit down?”), and (e) critical statements which express disapproval towards the child and/or their actions. In addition, during the PDI phase, the DPICS-IV measures child compliance and non-compliance with their parent’s commands.

The DPICS was standardized using a sample of 22 families (Eyberg & Robinson, 1983). Bessmer, Brestan, and Eyberg (2005) examined three types of validity using videotape coding with a sample of 30 non-referred mother-child dyads and 30 referred mother-child dyads. High convergent validity is established for the DPICS. Specifically, the seven DPICS composite scores accounted for significant variance in ECBI Intensity scale scores and Parenting Stress Index (PSI-3; Abidin, 1995) scores on the Child Domain, Parent Domain, and Parental Locus of Control scores. Six of the DPICS composite scores significantly discriminated between referred and non-referred families thus demonstrating discriminative validity (Bessmer et al., 2005). Schuhmann et al. (1998) examined compared the parent-child interactions of 64 families in either an immediate treatment or wait-list group in order to examine the treatment sensitivity of the DPICS. Compared to parents in the wait-list group, parents in the immediate treatment group exhibited significantly higher praise ratios (i.e., praise to total parent statements), more behavior descriptions, and less critical statements. Finally, estimates of inter-coder reliability ranged from .59 to .95 (Eyberg et al., 2013). Please see Table 9 for DPICS reliability estimates for each of the behaviors described above.

***Word Count Form.*** The Word Count Form (Abner, Bonney, Dugger, Lingerfelt, Michalk, & Suggs (2008) is an observational measure of the frequency of children’s expressive communication. Specifically, Word Count is defined as the number of intelligible words vocalized by child participants in a 5-minute period during the child led play portion of the DPICS-IV observation. In order to be recorded, children’s words must be distinct and separate

from one another, but they may be repeated. In a previous study conducted by Ginn, Clionsky, Eyberg, Warner-Metzger, & Abner (2017) researchers obtained 92% inter-rater reliability on this measure.

Table 9

*DPICS Reliability Estimates*

Categories	Behaviors	Kappa Correlations
Parent Verbalizations	Labeled Praise	.61
	Unlabeled Praise	.81
	Behavior Description	.60
	Reflection	.59
	Direct Command	.82
	Indirect Command	.66
	Information Question	.85
	Descriptive Question	.81
	Neutral Talk	.70
	Negative Talk	.69
Child Compliance After Parent Commands	Child Compliance	.64
	Child Noncompliance	.54
	Child No Opportunity for Compliance	.54

*Note.* Adapted from “Dyadic Parent-Child Interaction Coding System: Comprehensive Manual for Research and Training (4th ed.),” by S.M. Eyberg, M.M. Nelson, N.C. Ginn, N. Bhuiyan, N., and S.R. Boggs, 2013. Copyright 2013 by Parent-Child Interaction Therapy International.

***Autism Spectrum Rating Scale (ASRS) Short Form.*** Development of the ASRS Short Form was done through selecting items included on the ASRS Long Form that best distinguished nonclinical youth from youth diagnosed with an ASD (Goldstein & Naglieri, 2009). The Short Form may be used as a screener to determine which children may need additional services for ASD or to determine which children may need a more comprehensive ASD evaluation. Additionally, the Short Form may be used to monitor a child’s progress in a treatment or intervention program. Parents utilize a 5-point Likert scale to evaluate how often they observe behaviors in their child in areas such as self-regulation, communication, sensory sensitivity, socialization, behavioral rigidity, and unusual behaviors. Assessment results from this form include a Short Form Total Score. There are two separate ASRS Short Forms for children of

different age's groups. One form is for children between ages 2 to 5 and another for children between ages 6 to 18. Both versions of the ASRS Short Form contain 15 items that measure symptoms and behaviors associated with ASD, as rated by a child's parent. The Short Form takes approximately 5 minutes to complete.

Data collection for normative and clinical samples occurred over the course of 2 years during which over 7,000 assessments were collected, which included clinical data, normative data, and reliability and validity research data (Goldstein & Naglieri, 2009). Of these 7,000 assessments, 2,500 were included in the normative sample for the ASRS. Reliability data suggest a high level of internal consistency of .92. The ASRS also has excellent classification accuracy with a mean classification rate of 94.2% on the ASRS Short Form (2-5 Years) and 93.4 on the ASRS Short Form (6-18 Years); therefore, providing evidence for discriminative validity.

## **Procedures**

The following section describes the ethical procedures, screening methods, random assignment procedures, and the assessment schedule that were utilized in the study. The section concludes with a discussion of describing the data collection procedures, which occurred over three phases in the present study: screening, baseline, and treatment.

**Ethical considerations.** Prior to the start of data collection, the study was submitted to the University of South Florida Division of Research Integrity and Compliance Institutional Review Board (IRB) for approval. Parent informed consent was obtained from each parent participant prior to the start of the study. In an effort to protect the participants' identity, the primary investigator assigned pseudonyms to each dyad enrolled in the study. Data and participant information were kept confidential. All computer-generated data was stored in a

password-protected computer. Paper-generated data was stored in a locked file cabinet at the USF Silver Child Development Center.

**Stage-1 screening.** The Silver Child Development Center maintains a wait-list for children and families referred for and/or interested in receiving PCIT services. For the purpose of the present study, only established USF Health patients were eligible for screening. Therefore, these children were previously evaluated by a USF Health provider and referred internally through USF Health for participation in PCIT services. The primary investigator contacted the parents of children whom are established patients referred to the USF Silver Child Development Center for PCIT services. Once the parent expressed interest in participating in the study, the primary investigator followed the script provided on the study eligibility pre-screening consent form. At the start of the stage-1 screening session, which was conducted over the phone, parents were provided with a brief description of the study. Next, parents were asked to consent to proceeding forward with the stage-1 screening questions. Parents were informed that they could refuse to answer the questions and/or stop the interview at any time. Parents were asked a total of twelve screening questions to determine if they met the initial inclusion criteria for the study. Parents were asked questions to determine if their child met initial inclusion criteria including: (a) child is between 2-years old and 6-years and 11 months old, (b) fluent in English (c) not currently participating in any forms of intensive behavioral intervention services, (d) diagnosed with ASD by a qualified practitioner using DSM-V (APA, 2013) ASD diagnostic criteria, (e) able to provide a copy of the medical or psychological report. Parents were also asked questions to determine if they met initial screening criteria including: (a) fluent in English, (b) have access to reliable transportation (c) does not have a physical impairment, such as blindness or deafness that could significantly affect their ability to participate in treatment (d) does not have a

cognitive impairment, such as experiencing difficulty with learning new things or remembering detailed information that could significantly affect their ability to participate in treatment. Participants who met stage-1 screening criteria were asked to bring documentation of their child's ASD diagnosis to the stage-2 screening session. The research team did not copy the psychological report and promptly returned it to the parent after verification of the child's ASD diagnosis. Following the completion of the stage-1 screening session, the primary investigator asked the parent for the address of their current residence in order to mail them a copy of the informed consent form. Parents were mailed a copy immediately within one business day of the stage-1 screening session to ensure that they had adequate time to review the consent form and formulate any questions about the study. Parents were provided with the primary investigator's contact information (i.e., phone, email) during the stage-1 screening phone call and also had access to this information on the informed consent form. The primary investigator informed parents that the informed consent form would be mailed to their residence in a sealed manila envelope addressed from the primary investigator. Parents could contact the primary investigator directly with any questions and/or concerns about the study and informed consent process or they could wait to address any questions or concerns until the stage-2 screening session. The stage-2 screening session was scheduled at least one week after parents received the informed consent form to ensure that they had adequate time to review the form and decide if they wish to participate in the study. Participants were asked to wait to sign the informed consent form until the stage-2 screening session. The procedures involved in stage-2 of screening were reviewed with parents, including that they would know at the conclusion of stage-2 if they met the eligibility criteria for the study. Parents decided to decline participating in the study prior to the stage-2 screening session were asked to contact the primary investigator in order to cancel the



stage-2 screening session and were provided with information about other treatment options. Parents who did not meet stage-1 screening criteria were provided with information about other treatment options. The primary investigator offered to facilitate the referral process to other treatment options for interested families who either did not meet the inclusion criteria to participate in the study or if families chose to withdraw from PCIT treatment. Specifically, if families were interested in additional information about or initiating other treatment options then they were provided with detailed information on how to proceed and an internal referral was submitted for them, if requested.

The data collected during stage-1 screening for participants who signed informed consent to participate in the study was stored in a locked file cabinet maintained by the primary investigator. These data were filed separately from other study data in order to protect privacy. The data were destroyed at study completion. All data gathered for participants who did not meet the stage-1 inclusion criteria and those who decided not to participate in the study following the stage-1 screening session were destroyed immediately following the stage-1 screening session. All potential participants met the stage-1 screening criteria and moved forward with stage-2 of screening.

**Stage-2 screening.** At the start of the stage-2 screening session, prior to initiating the informed consent process, parents were asked to present documentation of their child's ASD diagnosis to the primary investigator for review to ensure that they met the initial inclusion criteria. The primary investigator immediately reviewed the documentation promptly returned it to the parent. All parents were provided with a copy of the informed consent form following the stage-1 screening session. If parents did not bring the informed consent form to the stage-2 screening session, they were provided with a new copy. At the start of the stage-2 screening

session, the primary investigator read through the informed consent document with all potential participants. The potential risks and benefits associated with study participation and alternatives to study participation were explained in detail. The research personnel attempted to engage the families in a discussion about study specifics and encourage them to ask questions regarding their participation in the research. Research personnel tried to foster open communication with potential participants and encouraged potential participants and their families to discuss study particulars and ask questions prior to research involvement. Participants were encouraged to continue to address and discuss any questions that arose during the study with the research personnel. Potential participants were informed that their participation was strictly voluntary and that if they chose to enroll in the study, they could withdraw from the study at any time without withdrawing from PCIT treatment. In addition, if they wanted to discontinue PCIT, the research personnel could provide them with additional treatment options. The information provided on the informed consent form was presented in simple language. If parents decided they wanted to move forward with the stage-2 screening process they were asked to sign the informed consent forms at that time. If parents signed the informed consent form prior to the stage-2 screening session, the primary investigator asked parents if they had any questions and/or concerns and then asked them to initial and date next to their signature in order to confirm that they understood the informed consent form and process.

After the informed consent process was completed, parents completed a demographic questionnaire. Next, additional information was gathered from potential parent and child participants to determine if they met the remaining inclusion criteria for the present study. Specifically, parents completed the ECBI to determine if their child's challenging behaviors fell in the clinically significant range ( $T$ -score  $\geq 60$ ). The primary investigator administered the

Preschool Language Scale – Fourth Edition (PLS-4) to potential child participants who did not have documentation of their receptive language abilities in order to assess if their receptive language abilities were greater than 24 months ( $T$ -score  $\geq 78$ ). The ECBI and the PLS-4 were scored at the end of the stage-2 screening session and parents were informed if they met criteria for the study or not. This last visit lasted approximately one hour.

Parents who did not meet stage-2 screening criteria were informed of the study criteria that were not met and the primary investigator addressed any questions and/or concerns. Parents who did not meet criteria or who did not want to participate in the study were provided with information about other treatment options available at the Silver Child Development Center, as well as community resources for children with ASD and their families. Parents were informed that could receive standard PCIT services at the Silver Child Development Center without participating in the research study. The primary investigator discussed these other treatment options with ineligible families and offered to assist them in accessing other standard clinical services offered through the Silver Child Development Center. If parents expressed interest in a specific option offered by the center, the primary investigator submitted an internal referral to the treatment option for the family. However, all participants who expressed interest in the study opted to sign consent and participate in the study.

**Random assignment.** Single case designs often utilize random assignment of participants, as it helps to ensure that the effects of the intervention are not due to extraneous factors, thus increasing the internal validity of the study (Kratochwill & Levin, 2010). Parent-child dyads enrolled in PCIT as they met the inclusion criteria for the study and expressed their interest in participation. Parent-child dyads enrolled on a continuous basis; however, only three could be recruited for the present study. Dyads completed a minimum of three baseline sessions.

Intervention start points were staggered by at least one week with a minimum of two data collection points (i.e., two baseline sessions) between intervention start points for each dyad.

Randomization was restricted in the present study. The three dyads were randomly assigned to one of three baseline conditions. Specifically, the first dyad was randomly assigned to start treatment after three baseline sessions over a week and a half. The second dyad was randomly assigned to start treatment after seven baseline sessions over three and a half weeks. The third dyad was assigned to begin treatment after five baseline sessions over two and a half weeks.

**Assessment schedule.** Data collection over three stages including screening, baseline, and treatment. Parent participants completed the demographic questionnaire and the ECBI at the stage-2 screening session. During the stage-2 screening session, the PLS-4 was administered to the child participant in Dyad 1 to obtain a recent measure of the child's receptive language skills. Dyad 2 and Dyad 3 provided documentation of recent evaluations, which provided evidence for their receptive language skills. Parent participants completed measures of their child's challenging behaviors (i.e., ECBI) and ASD symptoms (i.e., ASRS-SF) at the start of each baseline and treatment session. Upon arrival at the clinic, parents were handed the forms and completed them in the waiting room prior to coming back to the PCIT room for the session. For baseline sessions completed at the home setting, the parent was provided with the measures and filled them out prior to the completion of observational measures. After parents completed the ECBI and ASRS-SF, the PI observed the parent-child interactions and children's expressive communication using the DPICS-IV and the Word Count Form. Table 10 provides an overview of the variables, measures, and data collection schedule for the present study.

Table 10

*Data Collection Schedule*

Variable	Measure	Screening	Baseline	Treatment
Demographic Data	Demographic Questionnaire	X		
Receptive language	PLS-4	X <sup>a</sup>		
Challenging behaviors	ECBI	X	X*	X*
ASD symptoms	ASRS-SF		X*	X*
Parenting behaviors	DPICS-IV		X*	X*
Expressive communication	Word Count Form		X*	X*
PCIT integrity	PCIT Fidelity Checklists		X*	X*

*Note.* PLS-4 = Preschool Language Scale – Fourth Edition; ECBI = Eyberg Child Behavior Inventory; ASRS-SF = Autism Spectrum Rating Scale – Short Form; DPICS-IV = Dyadic Parent-Child Interaction Coding System – Fourth Edition.

<sup>a</sup> The PLS-4 was only administered to children without documented receptive language skills.

\* Indicates measure was administered weekly.

**Baseline phase.** After parent-child dyads were recruited and randomly assigned to conditions, at least three baseline conditions were scheduled with each dyad. The primary investigator conducted all baseline sessions. Dyads did not incur any costs for baseline sessions. In order to expedite the baseline phase, baseline sessions were held twice a week and lasted approximately 40 minutes. Parents completed at least one of the two weekly baseline sessions at the Silver Child Development Center but had the option for the primary investigator to come to their home to conduct the second weekly baseline session or to complete all baseline sessions at the Silver Child Development Center.

Parent participants completed the ASRS Short-Form and the ECBI at the start of each baseline session. The primary investigator utilized the DPICS-IV to code parent-child interactions during each baseline session. During the first 10 minutes of the DPICS-IV coding

observation, parents were instructed to play with their child in a typical manner with the toys provided. During this time, the primary investigator recorded any parent behaviors and/or verbalizations that could be categorized as CDI skills (i.e., behavior descriptions, labeled praises, reflections). During the last 5 minutes of the CDI observation, children's expressive communication was observed using the Word Count Form. Specifically, the observer recorded the number of verbalizations made by the child during the last 5 minutes of CDI. Next, parents' use of PDI skills were observed and recorded for 10 minutes using the DPICS-IV. Parents were instructed to give their child commands and parent's responses to children's compliance and non-compliance were observed and recorded as a measure of PDI skills. During the final segment of the DPICS-IV observation, parents were asked to involve their child in a 5 minute clean up session and parents' responses to their child's compliance and non-compliance were recorded again.

**Treatment phase.** All treatment sessions followed the procedures described in the PCIT manual (Eyberg & Funderburk, 2011) and adhered to the standard care of PCIT services provided at the Silver Child Development Center. Treatment sessions occurred once a week for approximately one hour at the USF Silver Child Development Center. Weekly data collection included systematic observation (i.e., DPICS-IV, Word Count) and rating scales (i.e., ECBI, ASRS-SF) at each session. Both phases of PCIT, begin with a teach session. The teach session was held immediately following the completion of the last baseline session; therefore, the last baseline session lasted approximately an hour and a half. No additional data was collected for the teach session since parents completed measures for the last baseline session and no additional observational data are collected during PCIT teach sessions. During the teach session, the PI discussed and demonstrated the skills for the upcoming treatment phase. Specifically, the PI

reviewed and modeled the skills and procedures with the parent, as well as engaged the parent in a role-play of the skills. All coaching sessions were held with the parent and their child, during which the therapist coached the parent on their use of the skills. Each coaching session began with a brief discussion with the child's parents. During this time, the PI spent 1 to 3 minutes addressing the parent's stressors unrelated to their child's behavior in order to provide the parents with some support. Following this discussion, the PI spent 5 to 10 minutes reviewing the parent's homework sheets and provided them with feedback and advice, as needed. During each CDI coaching session, the PI observed and coded parent's use of CDI skills for 5 minutes using the DPICS-IV (Eyberg et al., 2013). To meet CDI mastery criteria, parents had to use 10 behavior descriptions, 10 labeled praises, and 10 reflections with less than three questions, commands, and criticisms in one DPICS-IV coding session.

### **Data Analysis**

Initial analyses included the calculation of the degree of treatment integrity and also a measure of inter-observer agreement. Multiple data analysis techniques were used to analyze data from the repeated measures (i.e., ECBI, DPICS-IV, ASRS-SF, Word Count) involved in the present study. First, descriptive statistics (i.e., mean, standard deviation, range, slope) were calculated to address research questions one through six. Next, results from the repeated measures were graphed and visually analyzed. Finally, the Non-Overlap of All Pairs (NAP) was calculated to assess data overlap and provide an additional assessment of intervention effects.

**Intervention integrity.** Therapists completed fidelity checklists provided in the PCIT manual each session in order to ensure treatment consistency and fidelity. Each checklist included a list of items that should be completed during the PCIT session. Each item on the checklist includes columns, which the therapist used to record either a Yes (i.e., checkmark), No

(X), or Non-applicable (NA) that indicated the completion status of each individual item. The columns were summed to measure the degree of integrity for each session by examining the total number of completions, non-completions, and non-applicable items. The checklist also includes: (a) blanks for the rater and integrity checker to record comments about the session, (b) a formula for computing the integrity of the session, and (c) a section to record the length of session.

**Inter-observer agreement.** All sessions were videotaped for the purpose of establishing inter-observer agreement on at least 20% of data points collected during the baseline and intervention phases (Kratochwill et al., 2010). In order measure inter-observer agreement, the primary therapist and a co-therapist separately completed the DPICS-IV and Word Count Form observations. A percentage of agreement was calculated by dividing the frequency count obtained by the primary therapist to the frequency count obtained by the co-therapist.

**Visual analysis.** Single-case design often utilizes visual analysis in order to determine the following: (a) if evidence of a relation between the independent and dependent variables exists and (b) the strength or magnitude of that relation (Kratochwill et al., 2010). The data related to five variables of interest, parenting skills, child disruptive behavior, child ASD symptoms, child expressive communication, and parent stress, were graphed for each dyad.

Visual analysis involves four steps and includes six variables. The first step involves the documentation of a stable baseline data pattern. If the baseline trend is neutral or in the opposite direction of the expected behavior change then the baseline will be considered stable and predictable. In addition to using visual analysis to examine baseline stability, each participant's baseline stability will also be assessed using the baseline stability criteria established by Neuman & McCormick (1995). These criteria state that in order for baseline to be considered stable, 85% of the baseline data must fall within a 15% range of the average of all baseline data points during



the baseline phase. The second step consists of the examination of data within each phase of the study to determine if data display adequate consistency to demonstrate predictable patterns. The third step involves the comparison of data within each phase to determine whether PCIT was associated with changes in the dependent variable(s). The final step involves combining all data from the baseline and treatment phases to evaluate the presence of at least three demonstrations of a treatment effect at different points in time (Kratochwill et al., 2010).

In order to assess the specific effects and compare phases in the four previously described steps, six variables were examined individually and collectively. These six variables include the level (i.e., mean), trend (i.e., slope), variability (i.e., range or standard deviation from the slope), immediacy of effect, overlap, and consistency of patterns across comparable phases. An evaluation of the observed and projected patterns was performed during the baseline and treatment phases of the intervention (Kratochwill et al., 2010). In order to demonstrate a convincing treatment effect and casual relation, data patterns that demonstrate rapid or immediate effect, small proportions of overlapping data, and high consistency are desired (Kratochwill et al., 2010). The data were examined for level, trend, and variability. Due to the nature of PCIT, it was not expected to see any immediate shifts in level for parent stress or child outcomes. However, immediate changes in level of parent skills at the change of each phase yields information to determine internal validity. In the present study the data may demonstrate a significant change at the start of treatment as a result of an extinction burst, which commonly transpires in behaviorally based treatments. Specifically, an extinction burst occurs when children's challenging behaviors temporarily worsen before they improve. Extinction bursts occasionally occur in PCIT during the first or second CDI sessions when parents began using planned ignoring when their child engages in attention seeking behaviors.

In order to assess the overlap of data across phases, a non-parametric effect size, the Non-Overlap of all Pairs (NAP; Parker & Vannest, 2009) was calculated for Dyad 1. This method is commonly utilized with shorter data sets, making it appropriate for the present study. Established statistics highly support this method due to its' superior precision power (Parker & Vannest, 2009; Parker, Vannest, & Davis, 2014). NAP does not require the removal of minimum data points as typically required by earlier methods. The calculation of NAP involves the computation of the percentage of improved data from baseline to post-treatment, also referred to as the percent of non-overlapping data across phases.

## **Chapter Four: Results**

This chapter presents the data utilized to answer the research questions for the present study. The chapter begins with a description of the data entry processes. Next, intervention integrity data and inter-observer agreement are summarized. The chapter continues with analyses of data obtained from the three parent-child dyads in regard to the variables of interest.

### **Data Entry**

Research personnel screened measures at the time of data collection and if data were missing, the observer prompted the participant to complete the measure. The principal investigator scored protocols and entered the data into a Microsoft Excel spreadsheet. At least 20% of the protocols at each phase were scored by a second rater and compared to the original total entered into the spreadsheet. The data were scored and entered with 100% accuracy across participants and measures.

### **Intervention Implementation Integrity**

Integrity of the intervention was examined by completing PCIT integrity checklists each session. The fidelity of the therapist's intervention implementation was measured. The primary therapist maintained the PCIT treatment integrity checklist during each baseline and treatment session to ensure that each required component was consistently covered for each session. As a result, treatment was implemented with a high degree of integrity. Each checklist included items to be completed during the PCIT session. The average treatment integrity ranged from 90% to

100% for all sessions. The overall average treatment integrity was 98.89% with a standard deviation of 3.24, indicating that the treatment was implemented with high levels of integrity.

### **Inter-Observer Agreement**

Sessions were videotaped in order to obtain inter-observer agreement (IOA) for at least 20% of data collected via the observational measures employed in the present study (i.e., DPICS-IV, Word Count Form). Specifically, two observers coded at least 20% of the sessions then calculated the IOA. In order to calculate the IOA for CDI skills, the PI's frequency count for CDI skills was divided by a research team member's frequency count to obtain the percentage of agreement. Inter-observer agreement for CDI skills using the DPICS-IV ranged from 65% to 82%. The overall average IOA for CDI skills was 73% with a standard deviation of 7.26. Inter-observer agreement for children's expressive communication using the Word Count Form ranged from 83% to 93%. The overall average IOA for children's expressive communication was 90.25% with a standard deviation of 4.86.

### **Visual Analysis**

The present study utilized visual analysis to analyze data related to children's challenging behaviors, ASD symptoms, and expressive communication, as well as parents' use of positive parenting practices. In order for a treatment effect to be identified, the following requirements needed to be met: (a) dependent variable data patterns demonstrated predictable (i.e., stable) baselines (b) level changes between the baseline and treatment phase were in the direction of expected behavior change, and (c) small proportions of data overlap. Visual analyses for Dyad 1 were completed in accordance with four steps described by the WWC standards (Kratochwill et al., 2013). However, due to the attrition of Dyads 2 and 3 prior to the intervention phase of treatment, visual analyses were limited to the first three steps of the recommended process.

Specifically, visual analyses for data obtained from Dyads 2 and 3 solely involved the analysis of level, trend, and variability of data collected during the baseline phase.

Visual analysis results are described for the following dependent variables: children's challenging behaviors (i.e. ECBI Intensity and Problem Scales), positive parenting practices (i.e., DPICS-IV; Labeled Praises, Behavior Descriptions, and Reflections), children's ASD symptoms (i.e., ASRS Short-Form) and children's expressive communication (i.e., Word Count Form). Results are summarized and followed by graphical representations of the data and tables displaying descriptive statistics. Data overlap across the baseline and intervention phases was examined for Dyad 1 using the calculation of the Non-Overlap of All Pairs (NAP; Parker & Vannest, 2009).

**Children's challenging behavior (Research Question 1).** Children's challenging behaviors were measured weekly using the ECBI, which gathers data on the frequency of children's challenging behaviors (i.e., Intensity scale), as well as parents' distress level associated with their child's behavior (i.e., Problem scale). Results from parents' weekly ratings of their child's challenging behavior are described in the following sections.

**Intensity scale.** Data related to parent ratings of the intensity of their child's challenging behaviors during baseline and CDI are reported in Table 11 and Figure 1 displays a graphical representation of the data. Analysis of data trend indicated that Dyad 1 and Dyad 2 displayed positive baseline trends in the opposite direction of expected behavior change. Dyad 3 demonstrated a neutral slope of zero. Results from baseline stability analysis indicated that 100% of baseline data points for Dyad 1, Dyad 2, and Dyad 3 were within a 15% range of the average of all baseline data points. According to trend and baseline stability analyses, all three dyads met criteria for baseline stability (Neuman & McCormick, 1995). At screening (i.e., pre-

intervention), all child participants had clinically elevated ( $T$ -scores  $\geq 60$ ) levels of challenging behaviors as measured by the Intensity scale of the ECBI. During the baseline phase, the mean Intensity  $T$ -score fell in the clinical range for Dyad 1 ( $M = 64.00$ ,  $SD = 3.00$ ), Dyad 2 ( $M = 79.50$ ,  $SD = 2.17$ ) and Dyad 3 ( $M = 78.00$ ,  $SD = 2$ ).

A comparison of Dyad 1's levels of Intensity scores from the baseline phase ( $M = 64.00$ ;  $SD = 3.00$ ) to the treatment phase level ( $M = 58.75$ ;  $SD = 1.71$ ) indicated a decrease in ECBI Intensity levels (see Table 11). From a clinical perspective, this is significant, as in just a few treatment sessions there was a substantial decrease in scores to a nearly sub-clinical level. At the first week of the intervention, Dyad 1 showed an immediate shift in level. Dyad 1 displayed Intensity scores in the sub-clinical range by the second treatment session, which continued through the fourth and final treatment session. Dyad 1 displayed a negative trend, in the direction of expected behavior change, during the CDI phase. The positive trend exhibited by Dyad 1 during baseline clearly differs from the negative trend evident during the CDI phase. Dyad 1 also demonstrated low levels of variability during the treatment phase. Visual analysis results indicate an effect of treatment for Dyad 1, as evidenced by changes in level and trend from baseline to treatment, as well as an immediacy of effect upon following the implementation of the treatment phase. Analyses of data overlap across phases provided additional evidence for a treatment effect as indicated by a large non-parametric effect size ( $NAP = 95.83\%$ ).

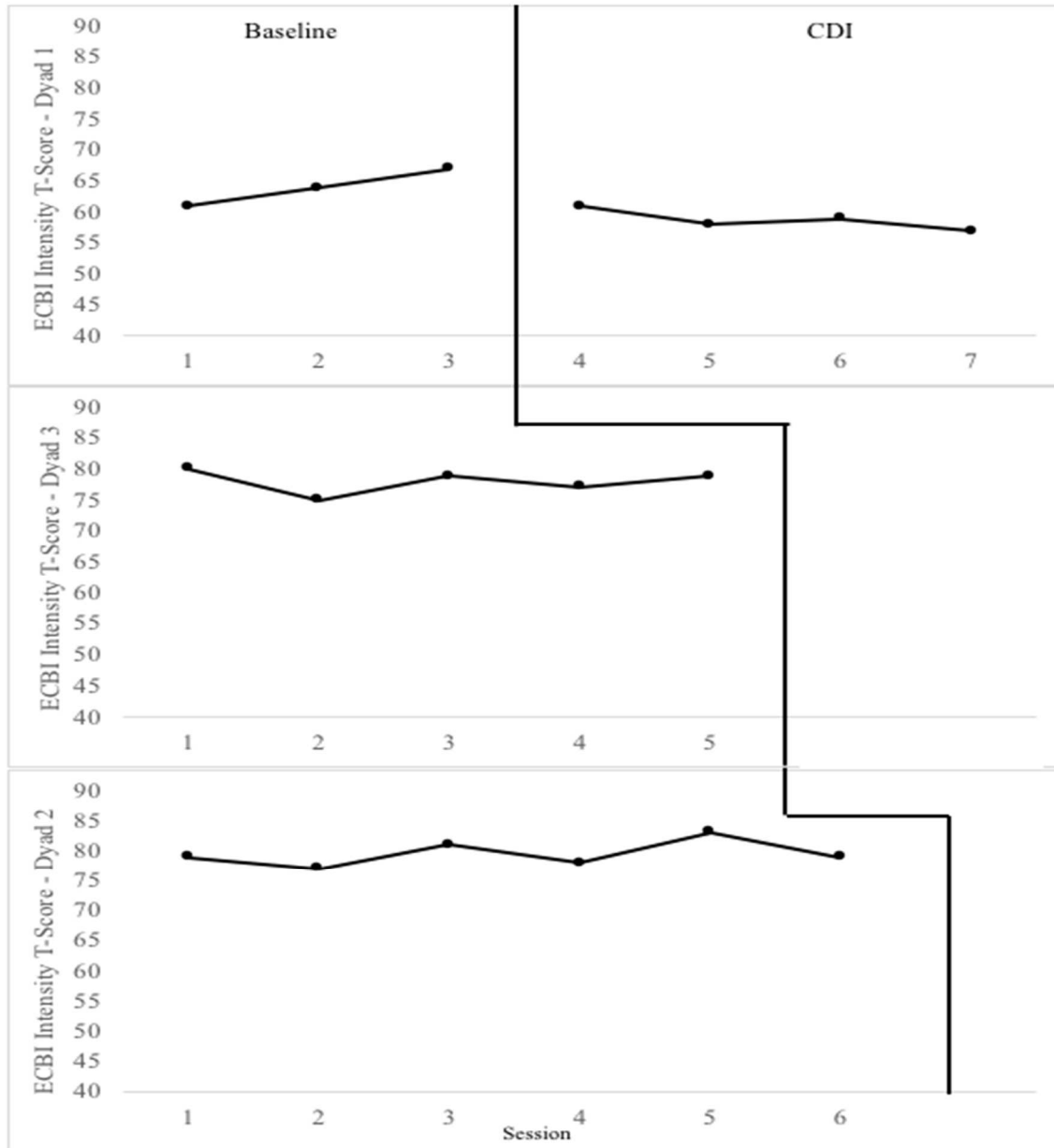


Figure 1. Multiple Baseline Results for ECBI Intensity Scale T-Scores

Table 11

*Descriptive Statistics for ECBI Intensity Scale*

	Baseline Phase			Intervention Phase		
	Mean ( <i>SD</i> )	Range	Slope	Mean ( <i>SD</i> )	Range	Slope
Dyad 1	64.00 (3.00)	61.00 – 67.00	3.00	58.75 (1.71)	57.00 – 61.00	-1.10
Dyad 2	79.50 (2.17)	77.00 – 83.00	0.42	--	--	--
Dyad 3	78.00 (2.00)	75.00 – 80.00	0.00	--	--	--

**Problem scale.** Data related to parent ratings of their stress associated with their child's challenging behaviors during the baseline phase and the treatment phase are reported in Table 12 and displayed graphically in Figure 2. Analysis of baseline trend indicated that all three dyads exhibited an upward trend during baseline in the opposite direction of expected behavior change. Results from baseline stability analysis indicated that 100% of baseline data points for Dyad 1, Dyad 2, and Dyad 3 were within a 15% range of the average of all baseline data points (Neuman & McCormick, 1995). Results from the two baseline stability methodologies indicated that all three Dyads met baseline stability criteria. At screening (i.e., pre-intervention), all child participants exhibited clinically elevated behaviors ( $T$ -scores  $\geq 60$ ), as indicated by scores on the Problem scale of the ECBI. During the baseline phase, the mean Problem  $T$ -score fell in the clinically significant range for Dyad 1 ( $M = 67.00$ ,  $SD = 1.73$ ), Dyad 2 ( $M = 80.17$ ,  $SD = 2.04$ ), and Dyad 3 ( $M = 77.80$ ,  $SD = 2.05$ ).

A comparison of Dyad 1's levels of Problem scores from the baseline phase ( $M = 67.00$ ;  $SD = 1.73$ ) to the treatment phase level ( $M = 64.75$ ;  $SD = 2.36$ ) indicated a minimal decrease in ECBI Problem levels (see Table 12). Although this change seems minimal, from a clinical perspective it is significant that there was a decrease in only a few treatment sessions. However, these scores remained in the clinically significant range. Dyad 1 demonstrated an observable change in level from the baseline phase to the treatment phase. This change in level occurred immediately upon starting the intervention phase. During the first three treatment sessions, Dyad 1 continued to exhibit a downward trend; however, at the fourth treatment session, they exhibited a reversal in trend due to a significant increase in scores. This significant increase resulted in an overall increase in trend for the treatment phase. It is hypothesized that increase was due to increased stress in the home environment, which the parent disclosed to the primary investigator.



Dyad 1 showed slightly more variability during the treatment phase compared to the baseline phase. Results from visual analysis indicate that Dyad 1 experienced a minimal change in level upon starting the intervention, which occurred immediately. Due to the significant increase in Dyad 1's Problem score on the fourth intervention point, there was data overlap between the baseline and treatment phase and also an overall positive trend during treatment. Dyad 1 appeared to experience an extinction burst at the fourth treatment sessions, which is evidenced by the significant increase in score at the last session. Extinction bursts commonly occur during the early stage of treatment as parents begin to remove their attention for children's attention-seeking behaviors. Therefore, visual analysis suggests a possible effect of PCIT on Problem scores. Analyses of data overlap across phases indicate a medium effect on Dyad 1's Problem scores from baseline to treatment (NAP = 79.17%).

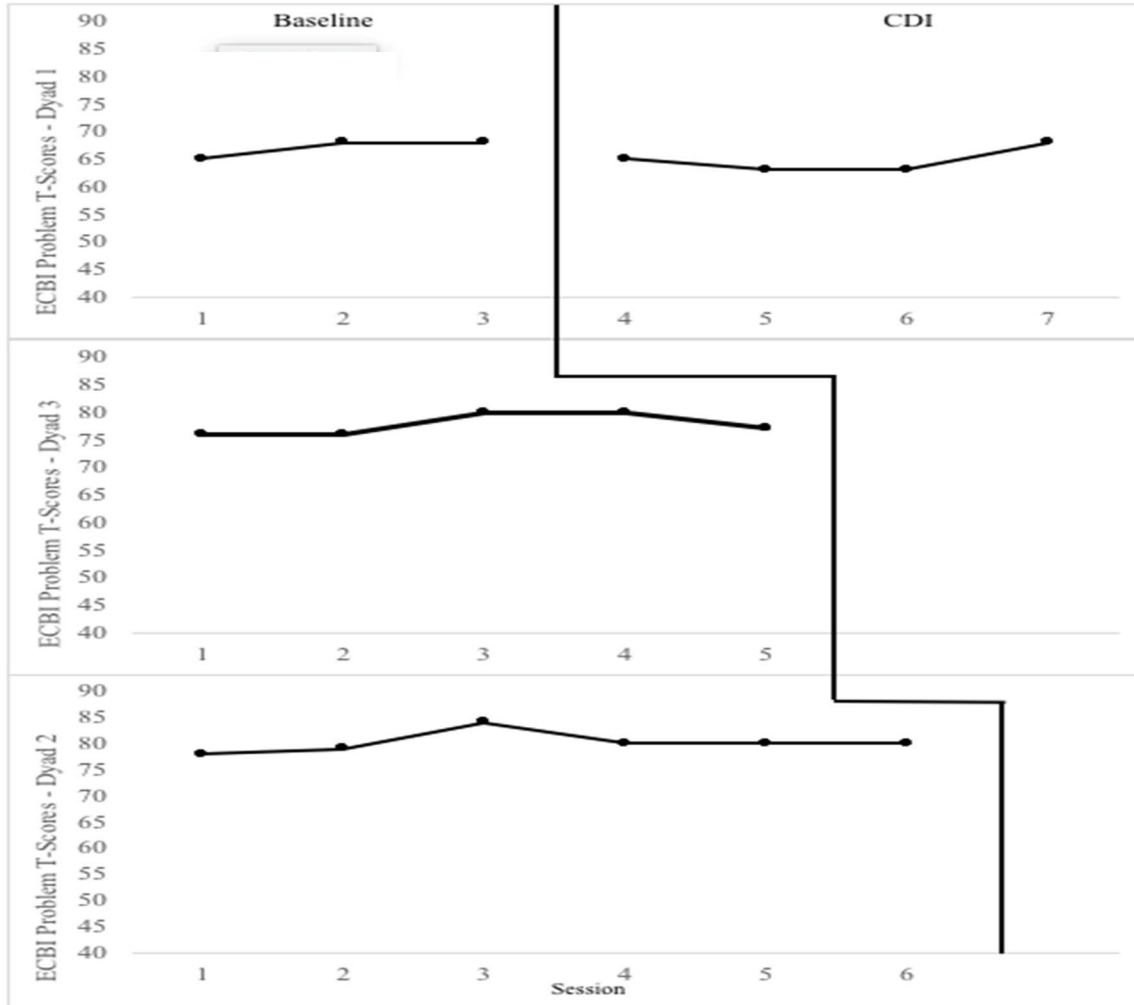


Figure 2. Multiple Baseline Results for ECBI Problem Scale T-Scores

Table 12

*Descriptive Statistics for ECBI Problem Scale*

		Baseline Phase			Intervention Phase		
		Mean (SD)	Range	Slope	Mean (SD)	Range	Slope
Dyad 1	Problem	67.00 (1.73)	65.00 – 68.00	1.50	64.75 (2.36)	63.00 – 68.00	0.90
Dyad 2	Problem	80.17 (2.04)	78.00 – 84.00	0.25	--	--	--
Dyad 3	Problem	77.80 (2.05)	76.00 – 80.00	0.60	--	--	--

**Parenting behaviors (Research Question 2).** Parents’ use of the CDI positive parenting skills (i.e., Labeled Praise, Reflections, and Behavior Descriptions) were measured weekly during the baseline and intervention phase using the DPICS. Visual analysis results for data

related to the positive parenting skills are summarized first. The results for each dyad are described in the following sections.

**Labeled praises.** Data related to parents' use of Labeled Praises during baseline and treatment are reported in Table 13 and displayed graphically in Figure 3. Analysis of baseline trend indicated that Dyads 1, 2, and 3 all displayed data with flat baseline trends and no variability. Results from Neuman & McCormick's (1995) baseline stability methodology indicated that 100% of baseline data points for Dyad 1, Dyad 2, and Dyad 3 were within a 15% range of the average of all baseline data points. According to both baseline stability methodologies, all three dyads met baseline stability criteria. The mean level of Labeled Praises was 0.00 across all three dyads during the baseline phase.

A comparison between the baseline phase level ( $M = 0.00$ ;  $SD = 0.00$ ) and the treatment phase level ( $M = 4.75$ ;  $SD = 3.20$ ) for Dyad 1 indicated an increase in the parent's use of Labeled Praises (see Table 13). Dyad 1 experienced a latency period of one treatment session before the parent exhibited a shift in level at the second treatment data point. During the treatment phase, Dyad 1 displayed a positive trend, in the direction of expected behavior change. Variability was minimal during the treatment phase. Results from visual analysis suggest a possible effect for Dyad 1 as evidenced by changes in level and trend from baseline to treatment; however, an immediacy of effect was lacking. Analyses of data overlap across phases also indicated the possibility of an observed effect for Labeled Praises, as evidenced by a medium non-parametric effect size (NAP = 87.50%).

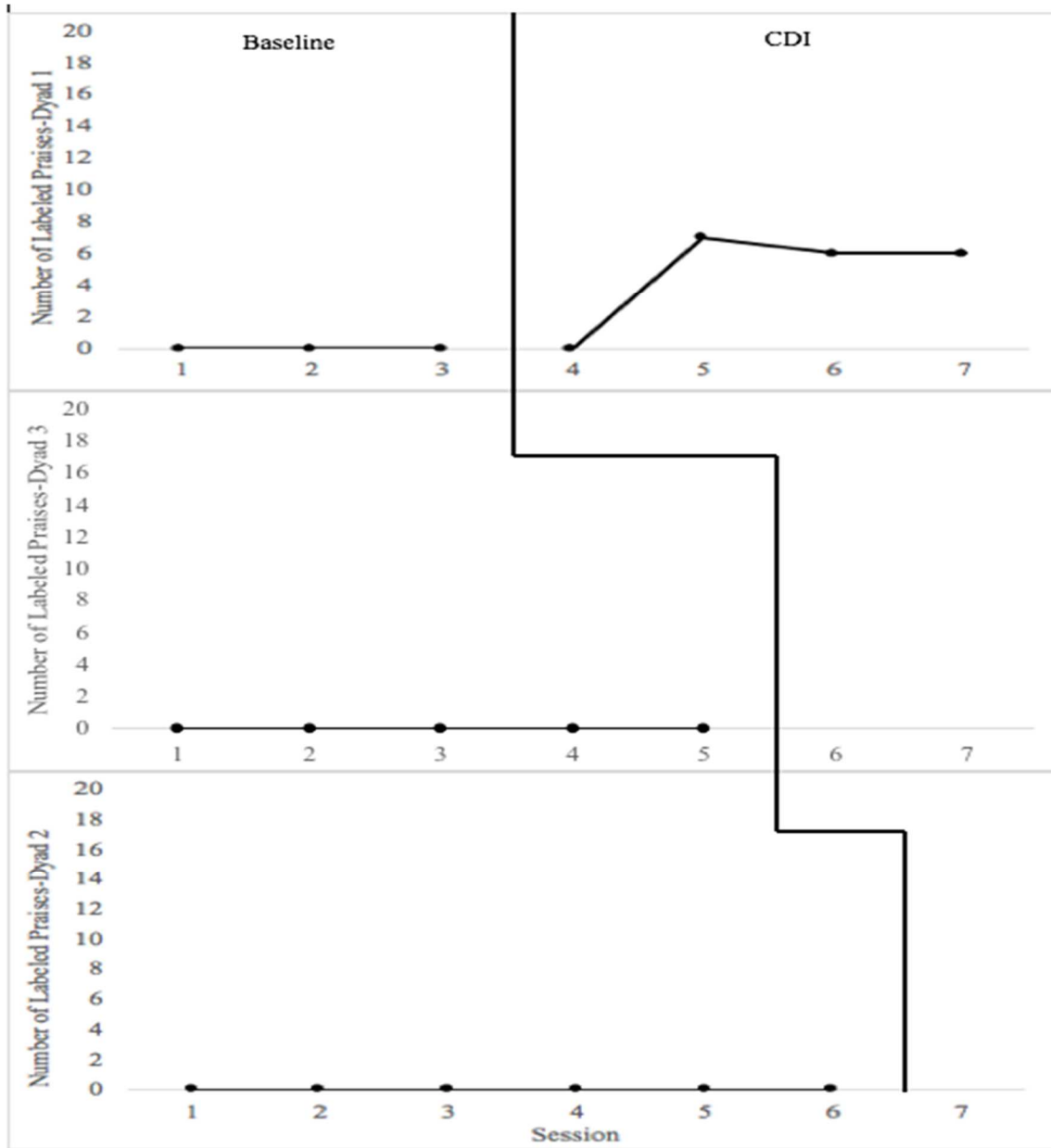


Figure 3. Multiple Baseline Results for DPICS Labeled Praises

Table 13

*Descriptive Statistics for DPICS Labeled Praises*

	Baseline Phase			Intervention Phase		
	Mean (SD)	Range	Slope	Mean (SD)	Range	Slope
Dyad 1	0.00 (0.00)	0.00 – 0.00	0.00	4.75 (3.20)	0.00 – 7.00	1.70
Dyad 2	0.00 (0.00)	0.00 – 0.00	0.00	--	--	--
Dyad 3	0.00 (0.00)	0.00 – 0.00	0.00	--	--	--

***Behavior descriptions.*** Data related to parents' use of Behavior Descriptions during baseline and treatment are reported in Table 14 and displayed graphically in Figure 4. Analysis of baseline trend indicated that none of the dyads demonstrated baseline stability. Specifically, Dyads 1, 2, and 3 showed slight upward baseline trends in the direction of expected behavior change. Neuman and McCormick's (1995) baseline stability analyses also indicated that none of the dyads met baseline stability criteria, as no dyad had 85% of baseline data points within 15% of the average of all data points collected during the baseline phase. In sum, none of the dyads demonstrated baseline stability according to the two methodologies. During the baseline phase, the mean total of Behavior Descriptions was 0.50 across all three parent-child dyads.

A comparison between the baseline phase level ( $M = 0.33$ ;  $SD = 0.58$ ) and the treatment phase level ( $M = 3.75$ ;  $SD = 3.50$ ) for Dyad 1 indicated an increase in the parent's use of Behavior Descriptions. The shift in level from baseline to treatment did not occur immediately. Specifically, Dyad 1 exhibited a latency period until the second week of the intervention before exhibiting a shift in level. As such, Dyad 1's first intervention point overlapped with the data from the baseline phase. During the treatment phase, Dyad 1 continued to display a positive trend, in the direction of expected behavior change. Although Dyad 1 displayed an overall increase in the frequency of their use of Behavior Descriptions, they showed more variability during the treatment phase compared to the baseline phase. Overall, visual analysis did not indicate shifts in trends or variability from baseline to treatment and only a minimal change in level was observed. Given data overlap and a lack of baseline stability, results from visual analysis cannot conclude that the increase in Dyad 1's use of Behavior Descriptions occurred as a result of PCIT. Analyses of data overlap across phases suggest the possibility of a treatment

effect on Dyad 1's use of Behavior Descriptions, as indicated by a medium non-parametric effect size (NAP = 83.33%).

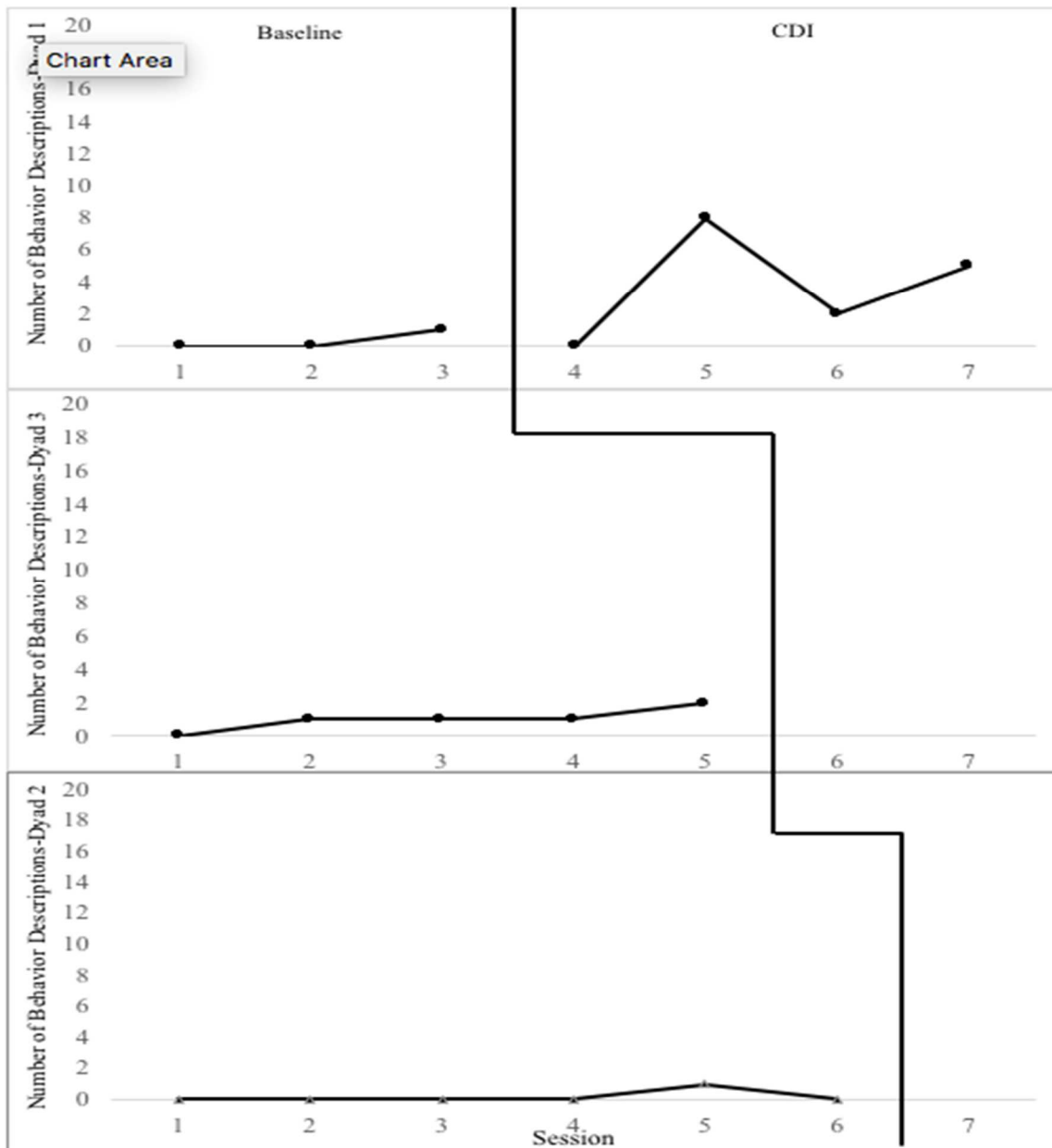


Figure 4. Multiple Baseline Results for DPICS Behavior Descriptions

Table 14

*Descriptive Statistics for DPICS Behavior Descriptions*

	Baseline Phase			Intervention Phase		
	Mean ( <i>SD</i> )	Range	Slope	Mean ( <i>SD</i> )	Range	Slope
Dyad 1	0.33 (0.58)	0.00 – 1.00	0.50	3.75 (3.50)	0.00 – 8.00	0.90
Dyad 2	0.17 (0.41)	0.00 – 1.00	0.40	--	--	--
Dyad 3	1.00 (0.71)	0.00 – 2.00	0.09	--	--	--

**Reflections.** Data related to parents' use of Reflections during baseline and CDI are reported in Table 15 and displayed graphically in Figure 5. Analysis of baseline trend indicated that Dyad 2 and Dyad 3 displayed baseline stability as evidence by negative baseline trends in the opposite direction of expected behavior change. Dyad 1 exhibited a positive baseline trend in the direction of expected behavior change, which suggests baseline instability. According to further analysis baseline stability using the methodology established by Neuman and McCormick (1995), none of the dyads met the criteria of at least 85% of baseline data points within a 15% range of the average of all baseline data points. According to both baseline stability methodologies, Dyads 2 and 3 met baseline stability criteria for baseline trend. During the baseline phase, the mean total of Reflections was 8.21 across all parent-child dyads.

A comparison between the baseline phase level ( $M = 4.33$ ;  $SD = 2.89$ ) and the treatment phase level ( $M = 7.75$ ;  $SD = 3.78$ ) for Dyad 1 indicated an increase in the parent's use of Reflections (see Table 15). The shift in level from baseline to treatment occurred immediately. During the treatment phase, Dyad 1 displayed a negative trend, in the opposite direction of expected behavior change; which appears to be affected by an extremely low score for the third intervention data point. As such, Dyad 1 showed more variability in data during the treatment phase compared to the baseline phase. Overall, some visual analysis results suggest the possibility of an effect; however, results do not meet all the criteria required to infer a basic

effect on Reflections as a result of PCIT. Results should be interpreted with caution due to instability during baseline, as well as an upward trend from baseline through treatment. Analyses of data overlap across phases support the possibility of an effect, as indicated by a medium non-parametric effect size (NAP = 83.33%).

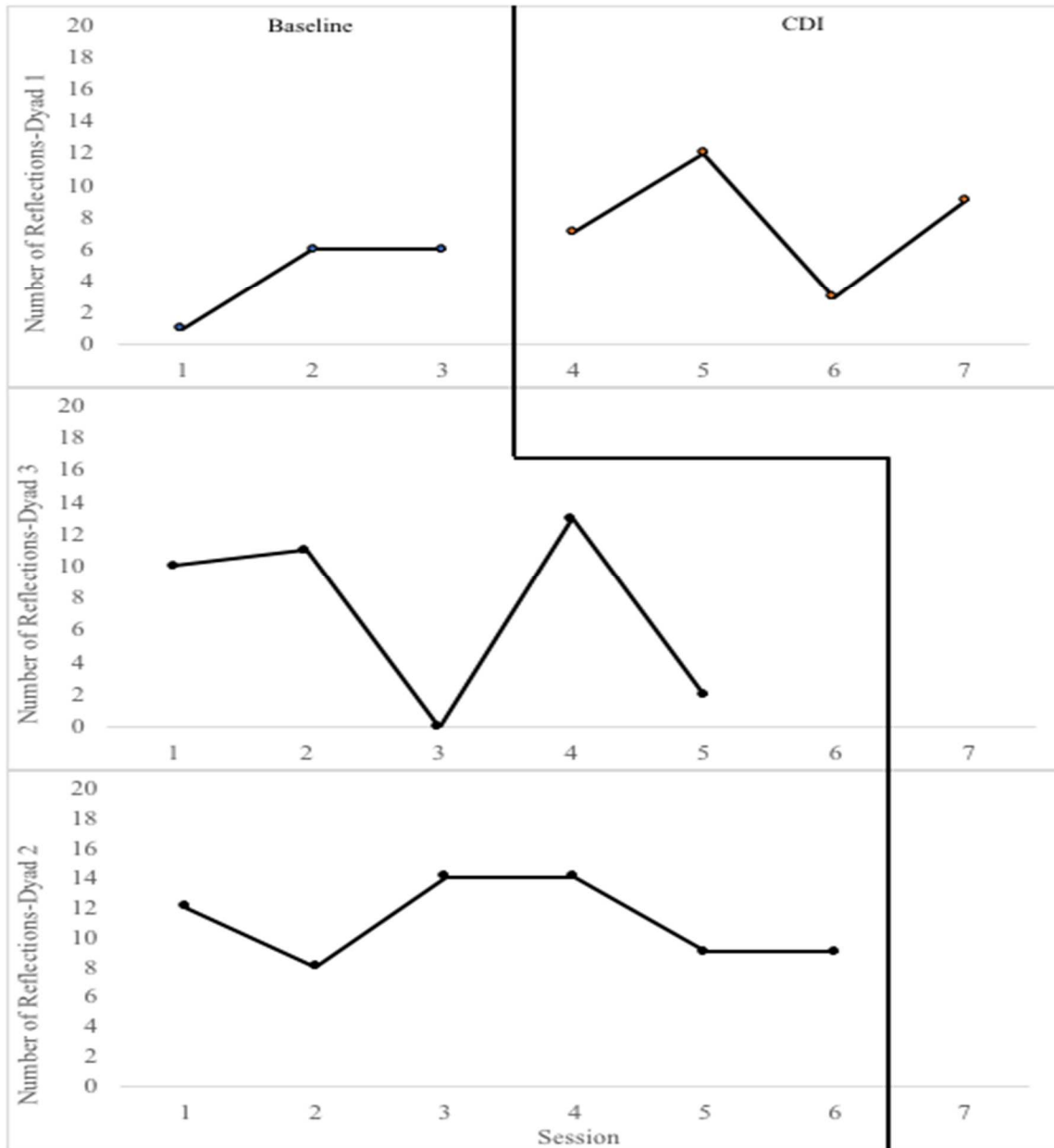


Figure 5. Multiple Baseline Results for DPICS Reflections



Table 15

*Descriptive Statistics for DPICS Reflections*

	Baseline Phase			Intervention Phase		
	Mean ( <i>SD</i> )	Range	Slope	Mean ( <i>SD</i> )	Range	Slope
Dyad 1	4.33 (2.89)	1.00 – 6.00	2.50	7.75 (3.78)	3.00 – 12.00	-0.30
Dyad 2	11.00 (2.68)	8.00 – 14.00	-1.40	--	--	--
Dyad 3	7.20 (5.81)	0.00 – 13.00	-0.34	--	--	--

**Children’s ASD symptoms (Research Question 3).** Parent participants rated their child’s ASD symptoms using the ASRS-Short Form. Data related to parents’ ratings of their child’s ASD symptoms are reported in Table 16 and Figure 6. Analyses of baseline trend indicated that Dyad 3 displayed a slightly upward trend, in the opposite direction of expected behavior change. Dyad 1 and Dyad 2 demonstrated negative baseline trends, which were in the direction of expected behavior change. Only Dyad 3 met baseline stability criteria according to baseline trend analyses. According to the Neuman and McCormick’s (1995) criteria for baseline stability, all three of the dyads met baseline stability criteria and each dyad had 100% of their baseline data points within a 15% range of the average of all data points during baseline. In sum, Dyad 3 displayed baseline stability according to both methodologies for baseline stability. Dyads 1 and 2 met baseline stability criteria for the methodology described by Neuman and McCormick (1995); thus, suggesting less evidence for baseline stability. During the baseline phase, the mean ASRS Short-Form *T*-score fell in the elevated range for Dyad 1 ( $M = 69.00$ ;  $SD = 1.00$ ) and in the very elevated range for Dyad 2 ( $M = 72.67$ ;  $SD = 0.82$ ) and Dyad 3 ( $M = 71.60$ ;  $SD = 0.55$ ).

A comparison between the baseline phase level ( $M = 69.00$ ;  $SD = 1.00$ ) and the treatment phase level ( $M = 66.75$ ;  $SD = 3.30$ ) for Dyad 1 indicated a minimal decrease in ASRS Short-Form scores (see Table 16). An immediacy effect was not observed for the change in level between phases. During the treatment phase, Dyad 1 displayed a downward trend, in the direction of expected behavior change during the treatment phase. A slight increase in variability

was also apparent compared to data in the baseline phase. Overall, some results from visual analysis indicate the possibility of an effect for Dyad 1, who exhibited an overall decrease in ASRS scores during the treatment phase. However, conclusions regarding an effect are limited due to the downward trend from baseline through treatment. Analyses of data overlap across phases for Dyad 1's ASRS-Short Form scores further confirm the possibility of an effect, as indicated by the calculation of medium non-parametric effect size (NAP = 66.67%).

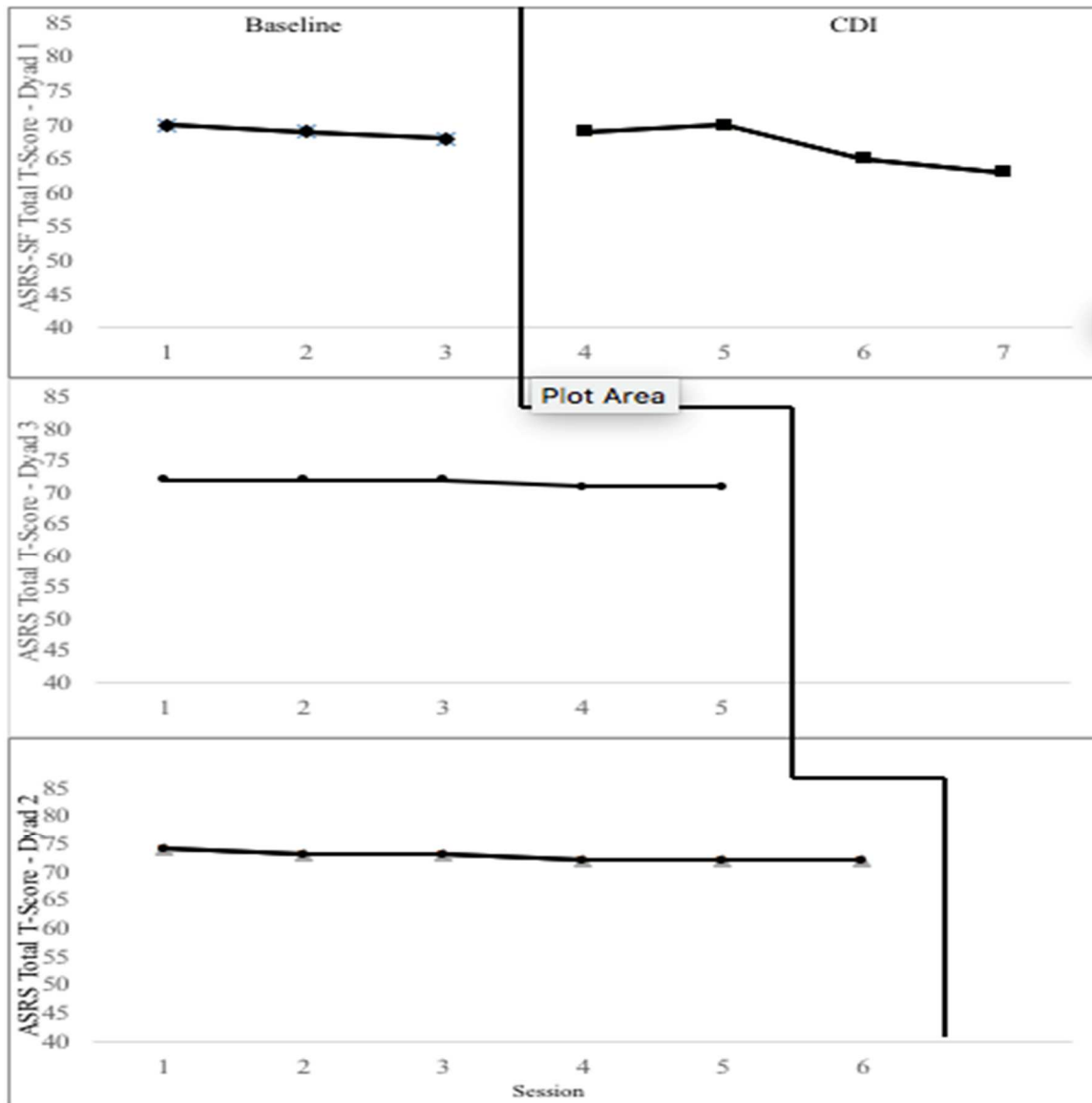


Figure 6. Multiple Baseline Results for ASRS Short-Form T-Scores

Table 16

*Descriptive Statistics for ASRS Short-Form*

	Baseline Phase			Intervention Phase		
	Mean ( <i>SD</i> )	Range	Slope	Mean ( <i>SD</i> )	Range	Slope
Dyad 1	69.00 (1.00)	68.00 – 70.00	-2.30	66.75 (3.30)	63.00 – 70.00	-1.00
Dyad 2	72.67 (0.82)	72.00 – 74.00	-0.40	--	--	--
Dyad 3	71.60 (0.55)	71.00 – 72.00	0.30	--	--	--

**Children’s expressive communication (Research Question 4).** The frequency of children’s expressive communication was measured using the Word Count Form. Data related to children’s use of expressive communication are reported in Table 17 and Figure 7. Analyses of trend during baseline indicated that Dyad 2 displayed a downward trend, in the opposite direction of expected behavior change. Dyad 1 and Dyad 3 demonstrated upward baseline trends, which were in the direction of expected behavior change. According to baseline trend analyses, only Dyad 2 met stability criteria. According to the Neuman and McCormick’s (1995) criteria for baseline stability, none of the dyads met criteria of at least 85% of their baseline data points within a 15% range of the average of all data points during baseline. Therefore, only Dyad 2 displayed moderate evidence for baseline stability according to analysis of baseline trend. During the baseline phase, the mean total Word Count across dyads was 128.15.

A comparison between the baseline phase level ( $M = 196.00$ ;  $SD = 111.72$ ) and the treatment phase level ( $M = 188.00$ ;  $SD = 80.20$ ) for Dyad 1 indicated a minimal decrease in Word Count frequency (see Table 17). Dyad 1 displayed an decreasing trend, in the opposite direction of expected behavior change during the treatment phase. Compared to the baseline phase, there was a minimal increase in variability during the treatment phase. Overall, visual analysis does not indicate that PCIT had an effect on expressive communication for Dyad 1. Analyses of data overlap across the baseline and treatment phases for Dyad 1’s Word Count

further confirmed the absence of an effect, as indicated by a small non-parametric effect size (NAP = 37.50%).

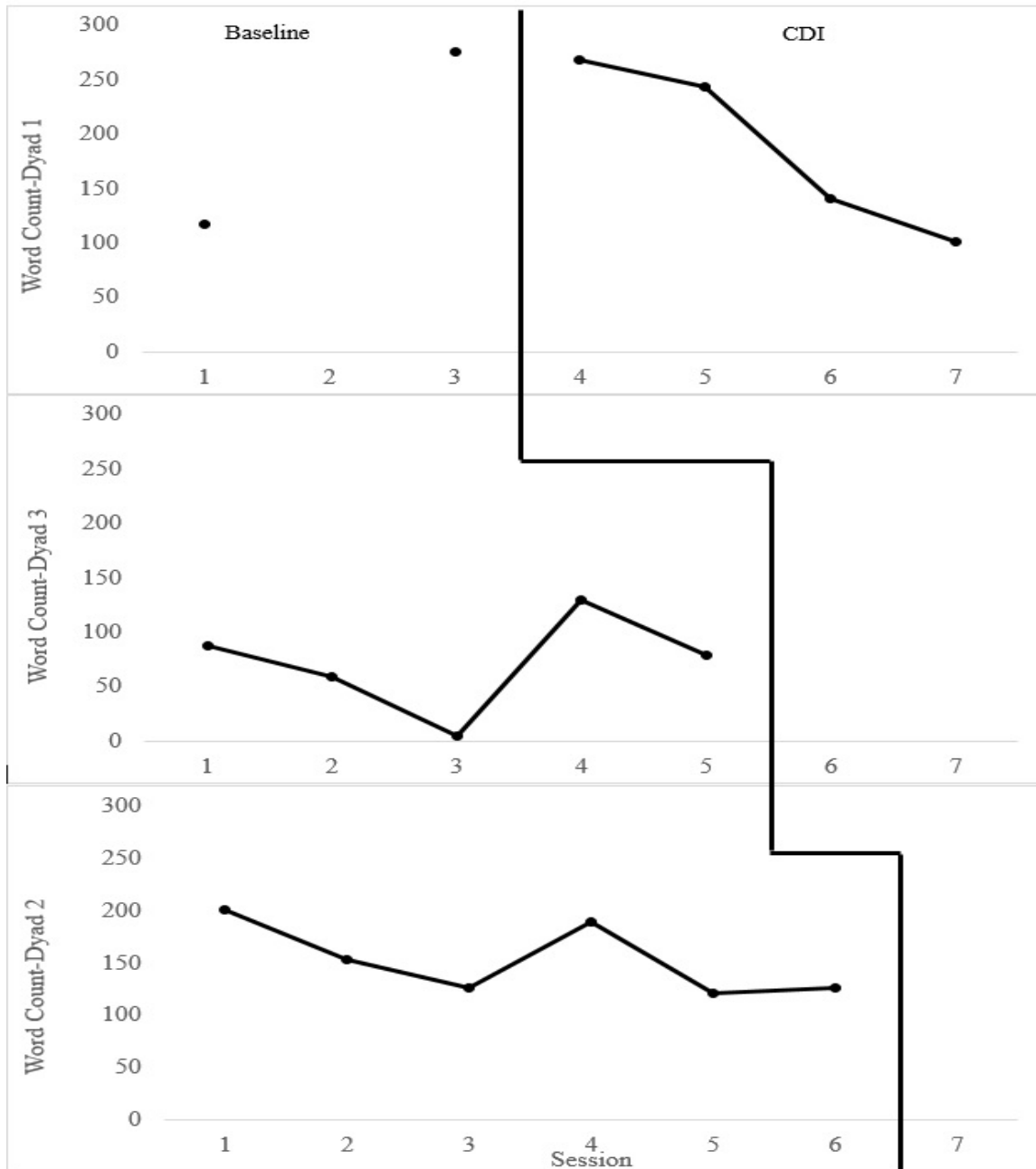


Figure 7. Multiple Baseline Results for Word Count Form

Table 17

*Descriptive Statistics for Word Count Form*

	Baseline Phase			Intervention Phase		
	Mean (SD)	Range	Slope	Mean (SD)	Range	Slope
Dyad 1	196.00 (111.72)	117.00-275.00	79.00	188.00 (80.20)	101.00-268.00	-60.40
Dyad 2	152.67 (34.88)	121.00-201.00	-11.66	--	--	--
Dyad 3	71.60 (45.59)	4.00-129.00	5.40	--	--	--

**Barriers to Treatment Participation (Research Question 6).** Both personal family barriers, as well as institutional barriers arose during the course of the study. The qualitative results will be described in the following sections.

**Family barriers.** Through the duration of the completed study sessions with each dyad, the PI checked in with each family at the start of each baseline and treatment session. During the course of study enrollment, numerous barriers to treatment completion were shared by the dyads with the PI. One barrier that all three dyads experienced was travel time to the university clinic setting. All traveled approximately one hour each way to the clinic for sessions, which during treatment added up to three hours of their time (e.g., 2 hours for travel, 1 hour for treatment). This was also problematic due to the dyads' work and school schedules. Although neither of the participating parents was employed, their spouses both wanted to be a part of treatment and had to miss work in order to do so. Additionally, parents were concerned about their child missing school. This was particularly stressful for one of the dyads because the child experienced significant anxiety about attending school; therefore, the parents did not want to continuously allow her to miss school and reinforce her avoidance. This dyad reported that stressors and other obstacles outside of treatment prevented them from attending sessions on a weekly basis; therefore, resulted in their withdrawal from the study. Another significant barrier that arose during the study was related to parent health. Specifically, one of the parents was in the early stages of pregnancy, which was associated with extremely severe morning sickness. This parent

disclosed that this was ultimately their reason for withdrawing from the study, as the sickness was so severe that the parent could not participate in the special play sessions required for PCIT.

Overall, any family participating in PCIT could experience the barriers discussed in this study; however, they appeared to have more implications from families of children with ASD. Research indicates that families of children with ASD experience increased stress levels compared to families of children with developmental disabilities and other impairments (Estes, Munson, Dawson, Koehler, Zhou, & Abbott, 2009; Schieve et al., 2014). As such, it is hypothesized that these treatment barriers were more intense for families of children with ASD, which appeared to contribute to the overall high attrition rate in the present study. Further research should examine barriers to treatment for families of children with ASD, as well as the need to tailor and/or adapt PCIT to meet the unique needs of these families.

***Institutional barriers.*** The following section will review some barriers that were experienced to conducting research in a clinical setting, as they have implications for future PCIT researchers. The present study required approval from the Institutional Review Board (IRB). Numerous barriers to the approval for clinical research and restrictions to the study occurred throughout the process of obtaining study approval and recruitment. One barrier to recruitment related to the restricted recruitment pool allowed in the present study. Specifically, in order to be recruited for the study, potential participants were required to be established patients at the health setting. In addition, they were also required to have an existing referral for PCIT services. Another barrier pertained to limitations placed on the recruitment methods for the study. Specifically, the PI could only attempt to contact and recruit families referred for PCIT by mail or e-mail. Although numerous families were contacted by mail and/or email, there was a very minimal response rate to these forms of communication. Standard clinic procedures involve

contacting referred families by phone in order to communicate with them and/or schedule them for services, which requires less time and effort compared to mail and e-mail communication.

Other institutional barriers occurred related to conducting research and providing psychological services in a medical setting such as challenges with referral and scheduling procedures. At the start of the study, the clinic implemented significant changes to the referral and scheduling procedures. These changes altered the process for managing and communicating new referrals for PCIT and thus impacted the recruitment process for the present study. Specifically, the PI was supposed to be notified when the clinic received new PCIT referrals in order to inform the families of the study and attempt to recruit them. On numerous occasions during the recruitment phase of the study, children were referred and scheduled for PCIT without informing the PI; therefore, the PI was unable to recruit them. Future PCIT therapists should keep these barriers in mind if conducting research in a clinical setting.

## **Chapter Five: Discussion**

Approximately 1 out of 4 of children with ASD also meet the diagnostic criteria for a disruptive behavior disorder (Kaat & Lecavalier, 2013). Disruptive behaviors increase in severity as children get older and often persist into adulthood without early intervention services (Murphy et al., 2005). Furthermore, many parents of children with ASD desire to first target their child's challenging behaviors such as aggression towards self-and/or others, tantrums, and non-compliance during treatment, prior to addressing other behaviors associated with ASD (Mandell, Walrath, Manteuffel, Sgro, & Pinto-Martin, 2005). If left untreated, disruptive behavior and non-compliance, can result in detrimental effects on children's academic achievement, language and communication abilities, and social-emotional development. Therefore, disruptive behaviors should be the primary target of early interventions for children with ASD and should be addressed prior to targeting other key areas for development. The core features of PCIT specifically address child compliance and social responsiveness to their parents' attention.

As a result of these disruptive behaviors, parents of children with ASD often experience significant levels of stress. In fact, parents of children with ASD report greater stress levels when compared to parents of typically developing children and also compared to parents of children with other disabilities including developmental delays and down syndrome (Estes, Munson, Dawson, Koehler, Zhou, & Abbott, 2009; Schieve et al., 2014). In general, parents who experience high levels of parenting stress often engage in ineffective parenting practices, which frequently lead to an increase in children's challenging behaviors. As such, maladaptive interaction patterns often develop which place strain on the parent-child relationship, further



increasing parental stress and child engagement in challenging behaviors. Parent-Child Interaction Therapy directly addresses these maladaptive interaction patterns by helping parents to deliver their positive attention to their child for appropriate behaviors while removing their attention for disruptive behaviors. In order to reduce these challenging behaviors and their associated increased levels of stress, parents must learn to set clear limits and consistent boundaries for their children's behavior.

The current study aimed to expand upon the minimal number of previous research studies, which include mostly case studies, by employing a more rigorous research design. Specifically, the study utilized a mixed methods approach with a non-concurrent multiple baseline design, to examine the degree of stability in numerous outcomes for children with ASD including the intensity and severity of children's challenging behaviors, ASD symptoms, and their use of expressive communication. The study also assessed the amount of stability in participating parents' use of positive parenting behaviors. Finally, due to the significant attrition rate in the present study, the study also collected and analyzed data related to the barriers to treatment participation experienced by parents. Subsequent sections include an examination of the findings for each research question, accompanied by a discussion of how the present study contributes to the existing literature base. The chapter concludes with a summary of the limitations associated with the study and future directions for research, as well as implications for practice.

### **Stability of Children's Challenging Behaviors**

The first research question assessed how stable the patterns of challenging behaviors exhibited by children with ASD were. Both the intensity of children's challenging behaviors and

parents' stress associated with their child's challenging behaviors, as measured by the ECBI, were examined.

All parents endorsed clinically significant scores on the ECBI for both the frequency of their child's challenging behavior (i.e., Intensity scale) and their distress level associated with the behavior (i.e., Problem scale) at pre-treatment and during the baseline phase. Results from visual analysis and examination of baseline stability indicated all three dyads showed strong evidence for baseline stability per parents' ratings on the ECBI Intensity and ECBI Problem scales. Baseline stability analyses indicated that all three dyads met baseline stability criteria for both ECBI scales according to both methodologies. According to analyses of baseline stability, 100% of baseline data points were within a 15% range of the average of all baseline data points for each dyad across both ECBI scales. In conclusion, children exhibited stable patterns of challenging behaviors during the baseline phase, as rated by their parents on the ECBI Intensity and ECBI Problem scale. From a clinical standpoint, children with ASD exhibited clinically significant levels of challenging behaviors throughout the baseline phase, which indicates stability in the clinical significance for these behaviors. Parents are instructed to rate these challenging behaviors on a weekly basis, so some variation is expected. However, overall, both analyses of baseline stability indicated stability and these patterns were typical of those found in the PCIT clinic. These findings suggest that prior to starting treatment, children with ASD exhibited stable patterns of challenging behaviors, which would likely continue without intervention.

It was expected that children would exhibit stable patterns of intensity and severity of their challenging behaviors given research regarding behavior patterns in children with ASD and related research on the use of PCIT for children with ASD. Research indicates a positive

correlation between levels of child ASD symptoms and parental stress (Hastings & Johnson, 2001). In addition, caregivers of children with ASD experience higher levels of stress compared to caregivers of typically developing children and children with developmental delays (Davis & Carter, 2008; Dumas, Wolfe, Fisman, & Culligan, 1991). Furthermore, without intervention, the challenging behaviors exhibited by children with ASD will likely persist into adulthood (Murphy et al., 2005). Additionally, children with ASD often display specific patterns of behavior and exhibit resistance to alterations in their routine or daily patterns (Wilkinson, 2014).

Currently PCIT with ASD literature only includes one study that utilized a non-concurrent multiple baseline design with random assignment of baseline conditions. Dyads in the present study started the treatment phase after the completion of their randomly assigned baseline sessions, whereas the past study required participants to meet baseline criteria, as evidenced by a downward or stable trend, prior to initiating the treatment phase. The results of the previous study indicated that children showed stable patterns of challenging behavior during the baseline phase (Masse et al., 2016). The results of the present study aligned with previous research suggesting that children with ASD exhibited clinically significant baseline levels of challenging behaviors, as rated by the ECBI. In addition, findings revealed that patterns of baseline stability in children's challenging behaviors aligned with previous research indicating that children with ASD exhibit stable patterns of challenging behaviors prior to treatment (Masse et al., 2016). This information holds great importance for families of children with ASD due to the prevalence of disruptive behaviors associated with ASD, as well as the high caregiver stress levels exhibited in parents of children with ASD. Thus, preliminary research indicates that PCIT may be a treatment option for families of children with ASD for reducing challenging behavior.

## **Stability of Positive Parenting Behaviors**

Next, the study examined how stable patterns of parents' use of positive parenting behaviors were. This involved the analysis of parents' use of Labeled Praises, Reflections, and Behavior Descriptions, as measured by the DPICS.

Visual analysis and analyses of baseline stability for parents use of the positive parenting skills indicated that parents displayed strong stability in their use of labeled praises and moderate stability in their use of reflections during baseline. Strong evidence for baseline stability in labeled praise use was indicated for Dyads 1, 2, and 3, as both of the two baseline stability analyses indicated evidence for baseline stability in labeled praise use. Moderate evidence for baseline stability in reflection use was indicated for Dyads 2 and 3, as one of the two baseline stability methodologies indicated that stability in patterns of reflection use was obtained. None of the dyads demonstrated stability in their use of behavior descriptions during the baseline phase. In conclusion, all parents exhibited strong stability in their patterns of labeled praise use and two of the three dyads showed moderate stability in their patterns of reflection use during the baseline phase. From a clinical standpoint, these positive parenting behaviors aligned with patterns of stability typical exhibited by parents at a PCIT clinic. Specifically, parents typically show some degree of variability in their use of these skills prior to receiving coaching, which occurs at the first CDI session. Of note, parents utilized very low levels of all of these positive parenting skills during the baseline phase. This also makes it more difficult to establish evidence for baseline stability, due to the low frequency in which all parenting behaviors are displayed by parents. Specifically, with low frequency variables, a small shift in the frequency count could make the variables appear unstable, as most baseline stability indices are used to analyze the stability of more high frequency behaviors, such as those measured by the ECBI. This indicates

that without intervention, parents of children with ASD may not use a high frequency of positive parenting skills, and thus this may be an important area for intervention for parents of youth with ASD.

Findings in the present study indicated that parents of children with ASD exhibited stable patterns of their use of the positive parenting skill, labeled praise, but did not suggest strong evidence of stability for parents' use of behavior descriptions or reflections during baseline. Previous research indicated that parents of children with ASD did not display any positive parenting skills during baseline, suggesting strong evidence for baseline stability in patterns of positive parenting skills (Masse et al., 2016). In the present study, comparable results for parents' use of labeled praise were indicated, as parents did not use this skill at all during the baseline phase and demonstrated strong evidence of baseline stability. However, results from the present study did not find comparable evidence for baseline stability in parents' use of behavior descriptions or reflections. As such, it may be that a longer period of baseline, without pre-established start points, would be necessary in order to establish baseline stability, in order to determine an effect of treatment.

### **Stability of Children's ASD Symptoms**

The current study also evaluated how stable the patterns of children's ASD symptoms were. Parent participants rated children's ASD symptoms each week during baseline and treatment using the ASRS-SF.

Findings indicated partial evidence for stability in children's patterns of ASD symptoms during the baseline phase. During the baseline phase, Dyad 1 reported elevated scores on the ASRS-SF and Dyads 2 and 3 reported scores in the very elevated range. Visual analysis and analyses of baseline stability for children's ASD symptoms indicated strong stability in baseline

patterns of ASD symptoms for Dyad 3 and moderate stability for Dyads 1 and 2. Specifically, only Dyad 3 met criteria for baseline stability criteria according to both methodologies, which indicates strong patterns of baseline stability. Dyads 1 and 2 only met the criteria for baseline stability according to one of the two methodologies, suggesting moderate patterns of baseline stability. In sum, analyses of baseline data patterns suggest that patterns of ASD symptoms were highly stable for Dyad 3 and moderately stable for Dyads 1 and 2. Taken together, patterns of ASD symptoms in children with ASD show some degree of stability prior to intervention. From a clinical standpoint, it would be assumed that children's ASD symptoms would remain stable, especially without intervention, due to the neurodevelopmental nature of the disorder.

Findings in the present study confirm findings from previous research examining PCIT for children with ASD (Ginn et al., 2017; Masse et al., 2016; Zlomke et al., 2017) indicating that as expected children with ASD exhibit clinically significant scores on measures of ASD symptoms and/or behaviors. As such, this finding contributes significantly to research, as it further indicates that without intervention, children exhibit clinically significant symptoms of ASD. Therefore, this presents an even more critical need to find interventions that may target the core symptoms of ASD, and more research on PCIT is needed to determine if it will have an effect on ASD symptoms specifically. However, the present study uniquely contributed to the literature by collecting data on ASD symptoms through weekly repeated measures of ASD symptoms throughout baseline and treatment.

### **Stability of Children's Expressive Communication**

Furthermore, the study assessed how stable patterns of expressive communication exhibited by children with ASD were. Children's use of expressive communication was measured weekly during baseline and treatment using the using the Word Count Form.

Findings did not indicate that children exhibited stable patterns of expressive communication during the baseline phase. Visual analysis and analyses of baseline stability for children's ASD symptoms indicated that only Dyad 2 displayed partial evidence for baseline stability. Specifically, none of the Dyads met the criteria for baseline stability according to both methodologies, which suggests unstable patterns of children's expressive communication. Overall, analyses of baseline data patterns indicate that patterns of children's expressive communication were moderately stable for Dyad 2. Taken together, patterns of expressive communication in children with ASD do not appear to be highly stable prior to intervention. From a clinical standpoint, this was a very difficult measure to employ, especially due to the frequent expressive communication exhibited by children. It is believed that this measure may be useful for children with low levels of expressive communication. Due to the variability in patterns, this indicates that more baseline sessions would be required in order to establish baseline stability and infer effects of treatment. This further highlights a limitation of prior research studies, which only include the collection of pre- and post-intervention data, which is problematic due to the high degree of variability in children's expressive communication without any intervention.

Findings from the present study indicated that children with ASD demonstrated appropriate levels of word-use, as demonstrated by their expressive communication skills during the baseline phase. This finding aligns with results from a previous study that utilized the Word Count Form as a measure of expressive language (Ginn et al., 2017). It is important to note that in order to meet the inclusion criteria of the study, children needed to exhibit receptive language skills of at least 24 months. Therefore, it may be that children in the present study already possessed adequate language skills, which did not need to be improved by treatment. Future

research may address this by including child participants with lower initial language abilities, in order to assess stability patterns in children's language and to determine if a true improvement in expressive language skills occurs as a result of treatment. The present study improves upon previous research by collecting repeated measures of children's expressive communication throughout baseline and treatment phases.

### **Immediacy of Effect on Patterns of Behavior**

The present study investigated whether or not there was an immediate treatment effect for the dependent variables in the study including: children's challenging behaviors, parent's positive parenting behaviors, children's ASD symptoms, and children's expressive communication from baseline to the start of PCIT.

**Child challenging behaviors.** At screening and throughout the baseline phase, Dyad 1 rated the frequency of Child 1's challenging behaviors in the clinically significant range. These ratings decreased at the start of the intervention and reduced to a non-clinical level at the second treatment session. Overall, the results indicate that PCIT decreased the intensity of Child 1's challenging behaviors, and that this effect occurred immediately from baseline to the first treatment session. Data analyses indicate a substantial decrease in Parent 1's Intensity scale ratings upon beginning PCIT. Visual analysis and non-parametric statistics indicated an observed effect as observed by clear decreases in ECBI Intensity scale scores, which occurred immediately from baseline to treatment. Nonparametric statistics indicated statistically significant decreases in Intensity scores immediately upon starting treatment. In sum, findings suggest that Dyad 1 experienced a decrease in the frequency of challenging behaviors as a result of PCIT. Although most families take numerous sessions in order to show a decrease in challenging behaviors,



previous research studies have supported the finding that parents report a decrease early on in treatment, during the CDI phase.

At screening and throughout the baseline phase, Dyad 1 rated their distress level associated with Child 1's challenging behaviors in the clinically significant range. These ratings decreased at the start of the intervention and during the first three treatment sessions; however, these ratings did not decline to sub-clinical levels. Overall, results do not indicate that PCIT decreased Dyad 1's ratings of their distress level associated with Child 1's challenging behaviors. Data analyses indicate an immediate decrease in Parent 1's Problem scale ratings upon initiation of PCIT. However, results from visual analysis were somewhat confounded by a significantly high score for the fourth and final treatment session. Non-parametric statistics comparing Dyad 1's scores at baseline and treatment found that PCIT had a medium effect on ECBI Problem scores for Dyad 1. In sum, findings suggest a possible effect of PCIT in reducing Dyad 1's distress levels associated with their child's challenging behaviors.

Hypotheses were developed as to why an effect of treatment was not observed for the degree of distress associated with children's challenging behavior, as measured by the ECBI Problem scale. Dyad 1 reported increased stress in their home life following the fourth treatment session. It is hypothesized that the increased level of overall stress for the parent might have resulted in a decrease in their tolerance for their child's challenging behaviors; therefore, resulting in an increased score on the ECBI Problem scale. Given the minimal number of treatment data points, this outlying data point appeared to impact data trend and as a consequence may have resulted in the lack of confidence in treatment effect for this variable. Furthermore, an immediate effect on children's challenging behaviors is not common in PCIT research. Therefore, it may be that in order to see a more significant effect, the participant would

have needed more CDI sessions and additional data points. Another possibility pertains to the occurrence of extinction bursts in children's challenging behaviors. Due to the removal of parent attention for attention seeking behaviors, the child in Dyad 1 may have increased their challenging behaviors in an attempt to obtain attention from their parent for previously reinforced behaviors. As such, these increases in challenging behavior could have led to increased levels of parent distress associated with the child's behavior.

**Positive parenting behaviors.** Analysis of Dyad 1's use of the positive parenting skills (i.e., labeled praises, reflections, behavior descriptions), as measured by the DPICS-IV, indicated an increase in Dyad 1's mean verbalizations for all three positive parenting skills. Medium nonparametric effect sizes were obtained for all three parenting skills, suggesting a moderate increase in Dyad 1's use of labeled praises, reflections, and behavior descriptions upon starting PCIT. Results from visual analyses only indicated stable baseline patterns for Dyad 1's use of labeled praises. Overall, visual analyses indicated Dyad 1 experienced a treatment effect on their use of labeled praises. According to visual analysis, stable baseline patterns were not established for Dyad 1's use of behavior descriptions or reflections. Visual analyses indicated that Dyad 1 increased in their overall use of behavior descriptions and reflections; however, results did not meet all criteria required to conclude a basic effect of treatment for these two variables. These findings suggest that four CDI sessions of PCIT were not sufficient in order to increase the parent's use of behavior descriptions and reflections. Previous research has indicated that parents of children with ASD displayed increased positive parenting skills as a result of PCIT; however, these results are after the completion of PCIT (Agazzi et al. 2013; Agazzi et al., 2017; Armstrong et al., 2013; Armstrong et al., 2015; Ginn et al., 2017; Hatmzadeh et al., 2010; Hansen et al., 2016; Lesack et al. 2014; Masse et al. 2016; Solomon et al. 2008; Zlomke et al., 2017).

The lack of significant treatment effect on Dyad 1's use of behavior descriptions and reflections may be attributed to the time required to achieve mastery of positive parenting practices. According to the PCIT manual, parents typically achieve CDI mastery criteria in about five to six treatment sessions. Therefore, a plausible explanation may be that Dyad 1 required more treatment sessions in order to display a significant increase in their use of the other positive parenting skills. Additionally, the parent might have experienced a certain degree of uneasiness due to the observation of their skills at the PCIT clinic by the therapist, which could have impacted the frequency of their use of positive parenting skills (Zisser & Eyberg, 2010).

**Child ASD symptoms.** Results from the present study showed mixed results in regard to the effect of PCIT on children's ASD symptoms. At screening and throughout the baseline phase, Dyad 1 endorsed ASD symptoms in the elevated range. The ratings of ASD symptoms did not show a decline until the third treatment session and never reached sub-clinical levels. Results from visual analysis did not reveal stable baseline patterns in Dyad 1's ASD symptoms. Furthermore, an immediate treatment effect on ASD symptoms was not indicated by visual analysis, despite an overall decrease in Dyad 1's ASD symptoms by the end of the treatment phase. However, results obtained from nonparametric statistical analyses indicated a medium effect. In sum, initial PCIT sessions were not found have an immediate effect on ASD symptoms and did not lead to a significant decrease in ASD symptoms for Dyad 1, during the four CDI sessions. Additional PCIT sessions may be required in order to see an effect on children's ASD symptoms.

Findings in the present study align with those found by the only multiple baseline study examining the use of PCIT for children with ASD. In this sample ( $n = 3$ ), participants showed a downward trend in children's autism-related behaviors across the treatment phase; however,

scores remained in the clinically significant range during treatment. In contrast to the present study, the study conducted by Masse et al. (2016) utilized the Autism Behavior Checklist (ABC; Krug, Arick, & Almond, 1980) as a measure of behaviors indicative of ASD. Additionally, the present study provided an important contribution by measuring ASD symptoms weekly during baseline and treatment while the previous study only administered a measure of ASD symptoms at three different time points (i.e., screening, post-treatment, follow-up).

Multiple hypotheses were considered with regard to the lack of evidence for a treatment effect on ASD symptoms, as measured by the ASRS-SF. One possible explanation is that the effect of PCIT on ASD symptoms was delayed. The last two data points for Dyad 1 showed a substantial decrease in ASRS scores compared to the first two treatment data points. Therefore, Dyad 1's weekly ratings of ASD symptoms may have shown a more substantial decrease with additional CDI sessions or if more data was collected following the start of CDI. In addition, it is possible that PCIT does not directly target all of the core symptoms of ASD and therefore overall ASD symptoms do not decline as a result of PCIT.

**Child expressive communication.** Analysis of Dyad 1's use of expressive communication, as measured by the Word Count Form, indicated a decrease in Dyad 1's mean use of expressive language from the baseline phase to the treatment phase. According to visual analysis, Dyad 1 did not exhibit stable baseline patterns for children's use of expressive language during the baseline phase. In addition, nonparametric statistical analyses revealed a small effect size. Taken together, these findings suggest that PCIT was not effective at increasing children's use of expressive communication.

It is hypothesized that there was not a significant increase, and instead, an overall decrease in expressive language due to the parent's use of planned ignoring for the child in Dyad

l's use of a "whiney voice." This seemed to escalate as the parent ignored the voice but the increase in vocalizations were not coded because they were inaudible sounds rather than clear distinct words. Additionally, it is not expected that initial PCIT sessions would cause a substantial increase in children's vocalizations, especially immediately. Future research should examine the impact of the full length of PCIT treatment on children with ASD whom exhibit more limited repertoires of language. This is an important contribution to existing literature because past studies have only looked at children's expressive communication at pre-intervention and post-intervention.

### **Barriers to Treatment Participation**

The final research question aimed to determine what institutional and family barriers interfered with the provision of PCIT in a medical setting and families' participation in treatment.

A variety of institutional barriers arose during the course of the study, which emphasizes the unique challenges to conducting research in a medical setting. In particular, these barriers included limited methods of communication (e.g., mail, e-mail) for recruitment, a restricted recruitment pool, and challenges with the referral and scheduling procedures utilized by the medical setting. Although the barriers to referral and scheduling procedures are typical in a clinical setting, some barriers were purely related to conducting research in a clinical setting (e.g., limitations on recruitment).

Families also reported several personal barriers to their participation in treatment. These barriers included travel time, work and school schedules, other stressors and obstacles outside of treatment, and the impact of parent health issues (i.e., pregnancy) on their ability to participate in treatment. For families participating in PCIT, these are commonly cited barriers; however, it may

be that these barriers are more significant for families of children with ASD, due to the significant drop-out rate in the present study, which is not typically seen in PCIT.

Research studies examining attrition in PCIT suggest that numerous characteristics are associated with drop-out in PCIT including high levels of mothers' stress (Boggs et al., 2004; Werba et al., 2006), negative or critical parenting behaviors (Werba et al., 2006), attitude towards treatment appears neutral or negative (Boggs et al., 2004), lower socioeconomic status (Fernandez & Eyberg, 2009), and slower symptom improvement (Lyon & Budd, 2010). In the present study, parent stress appeared to be a main reason for the families withdrawing from treatment. The other barriers identified through prior research did not seem as pertinent for families of children with ASD. Overall, the majority of barriers were logistical barriers around getting to and from treatment, scheduling, and then parent stress around other personal stressors. Future research should continue to explore if the barriers to treatment completion vary across child diagnostic groups.

### **Summary and Contributions to the Literature**

Results from the present study indicated that all children with ASD exhibited very stable patterns of challenging behaviors. Strong evidence for baseline stability was seen in the patterns of ASD symptoms displayed by Dyad 3, while Dyads 1 and 2 only displayed moderate stability patterns in ASD symptoms during the baseline phase. Parents of children with ASD displayed stable patterns of their use of labeled praises and moderately stable patterns of their use of reflections. A treatment effect was found for Dyad 1's frequency of child challenging behaviors, according to the ECBI Intensity scale. Partial evidence of a treatment effect was found for Dyad 1's distress level associated with child challenging behaviors, according to the ECBI Problem scale. This is important to note that in just a few CDI sessions, improvements in a variety of

variables were observed. In addition, PCIT increased Dyad 1's use of the positive parenting skill, labeled praise. Initial PCIT sessions did not prove to have an observed treatment effect on Dyad 1's ratings of child ASD symptoms, child expressive communication, or on parent's use of reflections or behavior descriptions. As such, it may be that additional PCIT sessions are necessary in order to see the benefits of treatment.

The results of the current study add to a limited literature base examining the use of PCIT for young children diagnosed with ASD. Previous research studies utilizing PCIT for children with ASD found similar results related an overall reduction in children's challenging behaviors (Agazzi et al., 2013; Armstrong et al., 2013; Armstrong et al., 2015; Ginn et al., 2017; Hatmzadeh et al., 2010; Lesack et al., 2014; Masse et al., 2016; Solomon et al., 2008; Zlomke et al., 2017). Specifically, these studies reported decreased ECBI scores for children with ASD following their participation in PCIT.

The current study uniquely contributed to the literature in numerous ways. Specifically, the present study utilized a non-concurrent multiple baseline design; which requires the establishment of stability in baseline patterns, which are necessary in order to draw causal inferences about an effect (Kratochwill et al., 2010). In addition, data collection involved the collection of weekly repeated measures in order assess the dependent variables in the study; whereas, previous studies only measured some of the dependent variables at three data collection points (e.g., screening, treatment, follow-up). In sum, the current study may be the to assess the effects of PCIT on children challenging behavior, ASD symptoms, and expressive communication and parents' parenting skills using several repeated measures. The study also provided an in-depth examination of stability in patterns of behavior across the dependent

variables, which previous research does not focus on. The patterns of stability found in the present study have important implications for future research.

### **Limitations**

The present study provides valuable information regarding the use of PCIT for children with ASD; however, numerous limitations should be considered upon interpretation of the findings. Limitations included a small sample size, and baseline procedures.

One limitation pertains to the small sample size of three parent-child dyads, which may limit the generalizability of findings to a larger population. Although the study originally intended to include five parent-child dyads, challenges with recruitment prevented the recruitment of additional participants. A variety of barriers arose during recruitment, which also highlight challenges in conducting research in a clinical setting, which prioritizes the delivery of services. The first barrier involved restricted methods of communication (e.g., mail, e-mail) to recruit potential participants. The majority of families whom were contacted about the study did not respond. It is hypothesized that these methods of communication were not preferred by families due to the increased time and effort required for a response compared to a phone call. Secondly, in order to be recruited for the study, potential participants needed to both be an established USF Health patient and have a referral for PCIT services by a health professional. Finally, referral and scheduling procedures led to an inability to recruit numerous children. Specifically, new referrals for PCIT services were supposed to be shared with the PI; however, on multiple occasions, children began treatment prior to announcing the referral to providers; therefore, making it impossible to recruit them. It is also important to note that two of the dyads were from the same family; therefore, not independent of one another.



The present study took place in a clinical setting, which prioritizes the delivery of clinical services to children and families in a timely manner, which posed limitations. In order to deliver such timely services, the number of baseline sessions for each dyad was pre-determined. As such, the ability to establish stable baselines may have been prevented or limited in the present study. In an attempt to reduce the threat to internal validity, the present study followed the WWC guidelines and collected two baseline data points between participant start points (Kratochwill et al., 2013). Dyads began the baseline phase non-concurrently as they enrolled in the study, which may have threatened the internal validity of the study. In order to address this threat, the present study randomly assigned participants to varying lengths of baseline, potentially leading to a reduction in the threats to internal validity.

### **Directions for Future Research**

Findings from the present study pose several areas for future research. The present study found evidence for a treatment effect of PCIT on children's challenging behaviors and parents use of labeled praise; however, findings did not suggest that initial sessions of PCIT caused a significant effect on children's ASD symptoms or expressive communication or on parents' use of behavior descriptions and reflections. In order to expand upon these preliminary findings, the current study should be replicated with a larger, more diverse, sample of parent-child dyads and utilizing more rigorous statistical methods. In addition, future studies should not utilize an a priori start point during baseline so that stable baselines can be established; thus, resulting in improvements in the accurate identification of treatment effects. Finally, due to the significant rate of attrition in the present study, future studies should aim to gather detailed information regarding tailoring the delivery of PCIT for families of children with ASD in order to collect meaningful data on ways to meet the unique needs of these families and overcome any common

barriers to treatment completion. Another important area for future research pertains to the collection of multiple data points, as some of the variables in the study were not very stable (e.g., children's expressive communication). Due to the significant amount of variability, studies utilizing pre-intervention and post-intervention measures are not going to be ideal in examining change in dependent variables with a high degree of variability.

The current literature base examining PCIT for children with ASD involves mostly clinical case studies and lacks the rigorous statistical methods utilized in randomized controlled trials. Future research studies should incorporate a variety of variables related to parents and their child with ASD, including parenting skills, child challenging behaviors, child ASD symptoms, and the generalization of treatment skills across settings and environments. Previous PCIT research with children who exhibit disruptive behavior disorders indicate that treatment effects can generalize into the classroom environment for these children. More specifically, the research base would benefit from studies that specifically assess the generalization of PCIT effects in the school environment (McNeil, Eyberg, Eisenstadt, Newcomb, & Funderburk, 1991). Variables of interest for these studies may include the examination of academic achievement, school behavior, and classroom engagement for children with ASD.

### **Implications for Practice**

Parents in the present study experienced barriers to their participation and completion of treatment, which ultimately led to their discontinuation of PCIT. The significant rate of attrition in the present study highlights the need to implement flexibility when working with families of children with ASD. Treatment attrition and lack of treatment attendance are not uncommon in clinic-based therapeutic approaches, including PCIT (Fernandez & Eyberg, 2005; Lanier, Kohl,

Benz, Swinger, Moussete, & Drake, 2011); however, little research explores attrition from PCIT specifically for youth with ASD.

Alternative methods of treatment delivery should be considered in order to improve the feasibility of clinicians' ability to conduct PCIT research and families ability to participate in and complete PCIT. A specific barrier experienced by the parents in the present study pertained to the time required to travel to and from the clinic (i.e., approximately 1 hour each way) once a week. These two hours of travel time plus one hour of treatment required participating families to dedicate a minimum of three hours of their day once a week to PCIT. Alternative treatment delivery methods include the delivery of PCIT at families' home environments either in person or through teletherapy. Recently, PCIT researchers have started to explore the use of a home-based PCIT model, which would likely reach more families. Preliminary research provide support for the successful implementation of home-based PCIT models and suggest positive outcomes such as decreased behavior problems on the ECBI and increased child compliance following treatment (Beveridge, Fowles, & Masse et al., 2015; Ware, McNeil, Masse, & Stevens, 2008). One of the recent single-case design studies examined the use of a home-based PCIT model for children with ASD and found positive results including decreased challenging behaviors, increase child compliance, increased parenting skills, and high levels of parent satisfaction with treatment (Masse et al., 2016). Innovations in technology allow for transformative options in treatment delivery, such as telehealth. The use of video teleconferencing (VTC) has been examined as an alternative method of treatment delivery, particularly in the provision of mental health care, which relies mostly on verbal communication and observation. Internet delivered treatment can address barriers to families' treatment accessibility such as transportation and convenience. Telemethods may also reduce the costs of

in-office care. As such, Comer and colleagues (2015) proposed the use of an online adaption of PCIT (I-PCIT), as one method to address barriers to the accessibility of PCIT. The researchers argue that given the design, online delivery of PCIT is suitable due to the in-vivo coaching.

Overall, the barriers to treatment experienced by the participants in the study and the high attrition rate highlight the need to examine alternative methods of treatment delivery in order to meet the unique needs of children with ASD and their families. One major barrier pertained to the scheduling and travel involved to attend PCIT. As such, home delivery options and telehealth appear to be viable alternative methods of deliver, with preliminary support in research. These methods should be further examined to determine their success at meeting the needs of children with ASD and their families.

Although PCIT is a manualized treatment with pre-determined mastery criteria and specific objectives for each session, it also allows for flexibility and individualization to meet the specific needs of each child and family. A major asset of PCIT relates to this ability to engage in flexibility by tailoring treatment to some degree in order to meet the specific needs of each family. Treatment tailoring is commonly done in PCIT and involves any changes in the delivery style or focus on the core treatment elements in order to best meet the unique needs of a family (Eyberg, 2005). This flexibility and individualization will be especially important when conducting PCIT with parents and children with ASD. PCIT therapists must also decide what, if any, changes need to be made to the standard treatment delivery protocol. While tailoring is sufficient for the majority of families, some families present with needs or situations that require adaptations to treatment. Adaptations refer to any modifications in the treatment content or structure (Funderburk et al., 1998). While adaptations were not necessary in the present study, several research studies have used a variety of adaptations in order to meet the specific needs of

children with ASD who presented with limited language abilities and differing levels of developmental delay (Agazzi et al., 2017; Armstrong et al., 2015; Lesack et al., 2014; Masse et al., 2016).

Children with ASD experience a higher risk for social isolation or exclusion in the school environment due to their challenging behaviors and social-functioning deficits in social functioning (Chung et al., 2015; Montgomery et al., 2014). Children with ASD whom experience social exclusion in the general education classroom often also experience poor teacher-student relationships (Robertson, Chamberlain, & Kasari, 2003). PCIT therapists should aim to support and generalize treatment skills by consulting and collaborating with teachers and other key school personnel. As such, the positive effects of an adult's use of positive interaction skills from PCIT may generalize to when teachers learn the PCIT skills. This could be utilized in order to attempt to develop more positive relationships between children with ASD and their teachers and to also generalize treatment skills to the school environment.

## **Conclusions**

Deficits in social-functioning place children with ASD at a high risk for the development of disruptive behaviors, which are unlikely to decrease without intervention. These behaviors can lead to adverse outcomes for both children and their caregivers. As such, it is imperative to identify evidence-based interventions for children with ASD. Current literature provides strong evidence for the efficacy of PCIT in improving numerous outcomes across a spectrum of child populations with behavioral challenges. As such, recent research studies have expanded efficacy research to include children with ASD. Results from the present study indicated that PCIT significantly improved children's challenging behaviors and parent's use of labeled praises. Research utilizing more rigorous research methods should be conducted in order to provide more

in-depth and higher quality data regarding the effective treatments for children with ASD, including PCIT, as well as methods to increase the feasibility of these treatments for families of children with ASD.

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## Appendices



## Appendix A: Parent Informed Consent to Participate in Research and Parent Permission for Child to Participate



### Consent to Participate in Research & Parental Permission for my Child to Participate in Research and Authorization to Collect, Use and Share Your Health Information

IRB Study #Pro00029735

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The following information is being presented to help you and your child decide whether or not you would like to be a part of a research study. Please read this information carefully. If you have any questions or if you do not understand the information, we encourage you to ask the researcher.

We are asking you to take part, and to allow your child to take part, in a research study called: **Efficacy of Parent-Child Interaction Therapy for Improving Challenging Behaviors, Autism Spectrum Disorder Symptoms, and Expressive Communication in Young Children with Autism Spectrum Disorder**

The person who is in charge of this research study is Kimberly Knap. This person is called the Principal Investigator. However, other research staff may be involved and can act on behalf of the person in charge. Kimberly Knap is being guided in this research by Dr. Heather Agazzi and Dr. Kathleen Armstrong.

The research will be conducted at the University of South Florida Silver Child Development Center located at 3515 E Fletcher Ave # E, Tampa, FL 33613.

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#### **Purpose of the study:**

The purpose of the present study is to

- Find out if Parent-Child Interaction Therapy (PCIT) is effective for improving challenging behaviors, autism spectrum disorder (ASD) symptoms, and expressive communication for children with ASD. Parent-Child Interaction Therapy is an evidence-based intervention that teaches parents positive parenting skills and techniques to manage their children's challenging behaviors.
- The study will measure the impact of PCIT on parent ratings of the frequency and intensity of their children's challenging behaviors and ASD symptoms. The study will

also examine changes in children's expressive communication, changes in caregivers' parenting practices, and caregivers' satisfaction with treatment.

The principal investigator is a doctoral candidate in the School Psychology program at the University of South Florida and is conducting this research for a dissertation.

### **Why are you & your child being asked to take part?**

We are asking you and your child to take part in this research study because your child is diagnosed with ASD and displays challenging behaviors that may benefit from treatment. We want to find out if PCIT will help your child's challenging behaviors, ASD symptoms, and communication.

### **Study Procedures:**

If you and your child take part in this study, you will be asked to:

- You will be asked to complete questionnaires about your child's behavior as part of a screening process. This study visit will take about 1 hour. The results of these assessments will determine whether you and your child will be offered the PCIT intervention.
- Next, you and your child will be randomly assigned to complete either 3, 5, or 7 baseline sessions (40 minutes each). During baseline sessions, the researcher will observe you and your child playing and ask you to complete questionnaires. You can attend all baseline sessions at the SCDC or can complete half at the clinic and half at your home. There is no charge associated with your participation in baseline sessions.
- After completing the baseline observations, you and your child will spend approximately 1 hour each week for approximately 12 to 15 weeks in PCIT treatment. At each PCIT study visit, you will be asked to complete two questionnaires. You will also be asked to practice the skills learned in PCIT for five minutes per day. If you do not meet mastery criteria after 20 treatment sessions, you may continue in treatment for as long as you desire until reaching mastery criteria but the collection of research data will be discontinued. During baseline and treatment sessions, you will wear a blue-tooth device and be observed through a one-way mirror. You will be charged the standard cost of PCIT services, \$35.00, for each treatment session
- At least half of all baseline session and all treatment sessions will be held at USF Silver Child Development Center located at 3515 E. Fletcher Avenue Tampa, Florida 33612. The number of times you will need to visit the SCDC will range from approximately 14 to 22 visits. This includes baseline observations and PCIT treatment sessions. The typical length of treatment for most families in PCIT ranges from 12 to 15 weeks but the number may be more or less depending on your consistency with attendance and skill practice. Families continue PCIT until they achieve mastery criteria.
- We plan to video and audiotape all baseline and PCIT sessions. Only authorized research personnel of the study will have access to the videotapes, which will be kept in a locked cabinet kept by the Primary Investigator. The videotapes will be destroyed five years after the end of the study.

### **Total Number of Participants**

5 parent-child pairs will be recruited to participate in this study at the Silver Center

## **Alternatives/Voluntary Participation/Withdrawal**

You and/or your child can decide not to participate in this research study and can still receive other services. Available alternatives offered by the SCDC include: dialectical behavioral therapy (DBT) and social skills groups, individual and family therapy, and applied behavior analysis (ABA) therapy.

You and your child should only take part in this study if both of you want to. You or your child should not feel that there is any pressure to take part in the study to please the study investigator or the research staff.

### **If you or your child decide not to take part:**

You and your child will not be in trouble or lose any rights you would normally have.

You and your child will still get the same services or health care benefits you would normally have.

Your child can still get regular services from your regular therapist.

You can decide after signing this informed consent form that you no longer want your child or yourself to take part in this study. We will keep you informed of any new developments, which might affect your willingness to participate or allow your child to continue to participate in the study. However, you and your child can decide to stop taking part in the study for any reason at any time. If you and/or your child decide to stop taking part in the study, tell the study staff as soon as you can. You can contact the study staff and/or primary investigator by phone, email, or in person at a scheduled session.

Even if you want to stay in the study, there may be reasons we will need to withdraw you and/or your child from the study. You and/or your child may be taken out of this study if we find out it is not safe for you and/or your child to stay in the study or if you and your child stop consistently attending your scheduled study visits. We will let you know the reason for withdrawing you and/or your child from this study. If we discover that your child is receiving applied behavior analysis while receiving PCIT, we will withdraw your child from the study, but not PCIT services.

## **Benefits**

Previous research suggests that the benefits of PCIT include:

- Improved parent-child relationships
- Significantly reduced child behavior problems and hyperactivity
- Reduced parent stress
- Improved parenting skills
- Improved parent confidence in using behavior management practices

We do not know if this study will reduce your child's ASD symptoms or affect their expressive communication skills, which is why we are conducting the present study.

## **Risks or Discomfort**

There is minimal risk to participants; however, the following risks may occur:

- You may feel some discomfort when you are participating in training on the use of new parenting skills and as you receive coaching through a one-way mirror via a communication headset. However, parents typically report being comfortable with PCIT procedures by the second or third session.
- You may experience increased stress levels due to the time needed to participate in the study.
- If you or your child experiences any of these risks or discomfort, please call the principal investigator, Kimberly Knap, at (904) 305-5141. If you or your child experience any risks or discomfort during the present study and wish to discontinue your participation in the study you will be provided with alternative treatment options.

## **Compensation**

You and your child will not receive any payment or other compensation for taking part in this study.

## **Cost**

You will be responsible for your own travel costs to the study location. Travel costs will not be reimbursed.

You or your medical insurance company will be expected to cover the standard costs of Parent-Child Interaction Therapy as provided by the Department of Psychiatry and Behavioral Neurosciences located within the Silver Child Development Center at the University of South Florida. The Silver Child Development Center accepts most insurance plans and offers private/out-of-pocket options. At the time of your visits, you may be responsible for any costs not covered by your health plan. Standard medical policies are followed at USF, thus the cost of PCIT services will be similar to the cost of visiting other non-USF physicians. The Silver Child Development Center offers an out-of-pocket option to families who do not have health insurance. A sliding scale is available to families who receive services from a graduate student service provider. The sliding scale rate is \$35.00 for a 60 minute PCIT session. In order to continue receiving PCIT services you must be able to pay for the standard cost of services. Your participation in research-related tasks is separate and in addition to standard care practices involved in PCIT; therefore, these tasks are not part of the bill for PCIT services. Research-related tasks include your participation in screening, baseline sessions, and the completion of questionnaires. Specifically, your participation in the research elements of the study will not be associated with any cost of PCIT standard care services. The total cost of treatment will depend on the number of PCIT sessions required for you to reach pre-determined mastery criteria. The average number of sessions required for families to complete PCIT is approximately 12 to 15 sessions. However, the number of sessions you attend will depend on how rapidly you acquire and mastery the skill criteria; therefore, PCIT may take more or less time than the estimated 12 to 15 weeks. You have the option to discontinue treatment at any time. No additional costs will be incurred if you decide to withdraw from the study or must discontinue your participation in

the study for any reason.

### **Privacy and Confidentiality**

We will keep you and your child's study records private and confidential. Certain people may need to see your study records. Anyone who looks at your records must keep them confidential. These individuals include:

- The research team, including the Principal Investigator and all other research staff.
- Certain government and university people who need to know more about the study, and individuals who provide oversight to ensure that we are doing the study in the right way.
- The USF Institutional Review Board (IRB) and related staff who have oversight responsibilities for this study, including staff in USF Research Integrity and Compliance.

We may publish what we learn from this study. If we do, we will not include you or your child's name. We will not publish anything that would let people know who you are. Any unanticipated problems involving risks to subjects or others, will be immediately reported to the PI's immediate supervisor, Dr. Sandra Stock, and to the USF IRB, as appropriate. For example, if a child or parent participant disclosed that they were being harmed or were planning on harming someone else then the PI would immediately contact Dr. Stock to address the situation as necessary.

### **You can get the answers to your questions, concerns, or complaints.**

If you have any questions, concerns or complaints about this study, call Kimberly Knap at (904) 305-5141.

If you have questions about you or your child's rights, complaints, or issues as a person taking part in this study, call the USF IRB at (813) 974-5638 or contact by email at [RSCH-IRB@usf.edu](mailto:RSCH-IRB@usf.edu).

### **Authorization to Use and Disclose Protected Health Information (HIPAA Language)**

The federal privacy regulations of the Health Insurance Portability & Accountability Act (HIPAA) protect your identifiable health information. By signing this form, you are permitting the University of South Florida to use your health information for research purposes. You are also allowing us to share your health information with individuals or organizations other than USF who are also involved in the research and listed below.

The following groups of people may also be able to see your health information and may use that information to conduct this research:

- The study research team, which includes the principal investigator and other research staff members;
- The medical staff that takes care of you and those who are part of this research study;
- The USF Institutional Review Board (IRB) and its related staff who have oversight responsibilities for this study, including staff in USF Research Integrity and Compliance and the USF Health Office of Clinical Research;

Anyone listed above may use consultants in this research study and may share your information with them. If you have questions about who they are, you should ask the study team. Individuals who receive your health information for this research study may not be required by the HIPAA Privacy Rule to protect it and may share your information with others without your permission. They can only do so if permitted by law. If your information is shared, it may no longer be protected by the HIPAA Privacy Rule.

By signing this form, you are giving your permission to use and/or share your health information as described in this document. As part of this research, USF may collect, use, and share the following information:

- Your research records
- All of your future medical and other health records held by USF, other health care providers or any other site affiliated with this study as they relate to this research project. This includes but is not limited to records related to HIV/AIDs, mental health, substance abuse, and/or genetic information.

You can refuse to sign this form. If you do not sign this form, you will not be able to take part in this research study. However, your care outside of this study and benefits will not change. Your authorization to use your health information will not expire unless you revoke (withdraw) it in writing. You can revoke this form at any time by sending a letter clearly stating that you wish to withdraw your authorization to use your health information in the research. If you revoke your permission:

- You will no longer be a participant in this research study;
- We will stop collecting new information about you;
- We will use the information collected prior to the revocation of your authorization. This information may already have been used or shared with others, or we may need it to complete and protect the validity of the research; and
- Staff may need to follow-up with you if there is a medical reason to do so.

To revoke this form, please write to:

Kimberly Knap  
For IRB Study #Pro00029735  
Silver Child Development Center  
3515 E Fletcher Ave # E, Tampa, FL 33613

In addition to writing a formal letter to withdrawal from the study, you may also contact the primary investigator by phone to discuss your withdrawal from the study.

While we are conducting the research study, we cannot let you see or copy the research information we have about you. After the research is completed, you have a right to see the information about you, as allowed by USF policies. You will receive a signed copy of this form.

**Consent to Participate and Parental Permission for My Child to Participate in this  
Research Study and Authorization to Collect, Use and Share His/Her Health Information  
for Research**

I freely give my consent take part and to let my child take part in this study and authorize that my child's health information as agreed above, be collected/disclosed in this study. I understand that by signing this form I am agreeing to take part in and to let my child take part in research. I have received a copy of this form to take with me.

\_\_\_\_\_  
Signature of Parent Taking Part in Study

\_\_\_\_\_  
Date

\_\_\_\_\_  
Printed Name of Parent of Child Taking Part in Study

\_\_\_\_\_  
Printed Name of Child Taking Part in Study

**Statement of Person Obtaining Informed Consent**

I have carefully explained to the person taking part in the study what he or she can expect from their participation. I confirm that this research subject speaks the language that was used to explain this research and is receiving an informed consent form in their primary language. This research subject has provided legally effective informed consent.

\_\_\_\_\_  
Signature of Person Obtaining Informed Consent

\_\_\_\_\_  
Date

\_\_\_\_\_  
Printed Name of Person Obtaining Informed Consent

## **Appendix B: Pre-Screening Informed Consent Script**

### **Informed Consent Script**

Hello, my name is Kimberly Knap with the study named Efficacy of Parent-Child Interaction Therapy for Improving Challenging Behaviors, Autism Spectrum Disorder Symptoms, and Expressive Communication in Young Children with Autism Spectrum Disorder (Pro #: 00029735) at the University of South Florida. Thank you for agreeing to talk to me today. I would like to take a minute before we begin to review your rights as a participant and confirm your desire to participate. In this conversation will be asking you some questions about yourself and your child to see if you are eligible to take part in the study.

The purpose of the study is to determine if an evidence-based intervention, Parent-Child Interaction Therapy (PCIT) is effective for improving challenging behaviors, autism spectrum disorder (ASD) symptoms, and expressive communication for children with ASD.

During this conversation we will need to ask you some questions to gather some initial information about you to see if you will be eligible to take part in this study. Our conversation should last about 10 to 15 minutes.

You are free to stop participating in the pre-screen interview or in the study at any time.

To our knowledge there may be personal benefits to you by participating in this study. If you are eligible to take part in the study after this interview, you will be given more detailed information about the study to help you decide whether you would like to participate in the study. If you decide to participate, you will be asked to return a signed consent form and the information from the pre-screen interview will be confirmed through record review, behavior-rating scales, and possibly by testing your child at a second screening session.

If you are not eligible to take part, you will be able to participate in PCIT but just not in this study or you can receive other alternative services available at the Silver Child Development Center. If you are not eligible, your responses will be discarded immediately.

There are no known risks to those who take part in the pre-screen.

You will not be paid for this pre-screening information.

The federal privacy regulations of the Health Insurance Portability & Accountability Act (HIPAA) protect your identifiable health information. By verbally assenting, you are permitting the University of South Florida to use your health information for research purposes. You are also allowing us to share your health information with individuals or organizations other than USF who are also involved in the research and listed below. In addition, the following groups of people may also be able to see your health information and may use that information to conduct this research:

- The study research team, which includes the principal investigator and other research staff members;



- The medical staff that takes care of you and those who are part of this research study;
- The USF Institutional Review Board (IRB) and its related staff who have oversight responsibilities for this study, including staff in USF Research Integrity and Compliance and the USF Health Office of Clinical Research;
- Data Safety Monitoring Boards or others who monitor the data and safety of the study;

Anyone listed above may use consultants in this research study and may share your information with them. If you have questions about who they are, you should ask the study team. Individuals who receive your health information for this research study may not be required by the HIPAA Privacy Rule to protect it and may share your information with others without your permission. They can only do so if permitted by law. If your information is shared, it may no longer be protected by the HIPAA Privacy Rule.

By agreeing to provide your Authorization, you are giving your permission to use and/or share your health information as described in this document. As part of this research, USF may collect, use, and share the following information:

- Your research records
- All of your past, current or future medical and other health records held by USF, other health care providers or any other site affiliated with this study as they relate to this research project. This may include but is not limited to records related to HIV/AIDs, mental health, substance abuse, and/or genetic information.

You can refuse to provide your Authorization. If you do not consent you will not be able to take part in this research study. However, your care outside of this study and benefits will not change. Your authorization to use your health information will not expire unless you revoke (withdraw) it in writing. You can revoke this form at any time by sending a letter clearly stating that you wish to withdraw your authorization to use your health information in the research. If you revoke your permission:

- You will no longer be a participant in this research study;
- We will stop collecting new information about you;
- We will use the information collected prior to the revocation of your authorization. This information may already have been used or shared with others, or we may need it to complete and protect the validity of the research; and
- Staff may need to follow-up with you if there is a medical reason to do so.

To revoke this Authorization, please write to:

Kimberly Knap  
 For IRB Study #Pro00029735  
 Silver Child Development Center  
 3515 E Fletcher Ave # E, Tampa, FL 33613

While we are conducting the research study, we cannot let you see or copy the research

information we have about you. After the research is completed, you have a right to see the information about you, as allowed by USF policies.

Your comments will be kept confidential and your name will not be attached to any transcript or report. However, the USF IRB and Department of Health and Human Services are able to review all research records. If you have any concerns you can call the PI, Kimberly Knap at (904) 305-5141, or the Division of Research Integrity and Compliance at the University of South Florida at (813) 974-5638.

Would you like to participate in the pre-screen interview? Do you have any questions before we begin?

## Appendix C: Stage-1 Phone Screening Questions

### Stage-1 Phone Screening Questions

**Thank you for agreeing to talk with me today about the research study. The purpose of these questions is to determine if you and your child meet the criteria to participate in the study.**

1. **How old is your child?** *(Child must be between 2 years and 6 years, 11 months of age)*
2. **Are you over the age of 18?** *(Parent must be over 18)*
3. **Are you the child's biological or adoptive parent?** *(If respondent says, "No," the interviewer will thank them for their time and indicate that only a biological or adoptive parent can consent to the child's participation in the study)*
4. **Does your child live with you?** *(Child must live with participating parent)*
5. **Has your child lived with you for at least the past 6 months?** *(Child must live with participating parent for a minimum of 6 months)*
6. **Does your child have Autism Spectrum Disorder (ASD)? Was this diagnosis made using current ASD diagnostic criteria?** *(Child must have an established diagnosis of ASD based on Diagnostic and Statistical Manual of Mental Disorders – Fifth Edition (DSM-5) criteria (2013). Can ask year of diagnosis to clarify. )*
7. **Do you have a copy of the medical or psychological report indicating his/her diagnosis? Did the professional use the most current ASD diagnostic criteria (2013) to make their diagnosis?** *(Parent must be able to show the researchers a signed medical or psychological report at the stage-2 screening session.)*
8. **Is your child currently receiving any form of intensive behavioral intervention services to address ASD symptoms or behavior concerns?** *(Child must not currently receive other therapy)*
9. **Does your child speak English fluently?** *(Child must speak fluent English)*
10. **Do you speak English fluently?** *(Parent must speak fluent English)*
11. **Do you have a physical impairment, such as blindness or deafness that could significantly affect your ability to participate in treatment?** *Parents must not have any significant physical impairment)*
12. **Do you have a cognitive impairment, such as experiencing difficulty with learning new things or remembering detailed information that could significantly affect your ability to participate in treatment?** *(Parents must not have any significant cognitive impairment)*

13. **Do you have reliable access to transportation?** (*Participants must have access to reliable transportation to and from intervention site*)

IF THE RESPONDENT DOES NOT MEET CRITERIA FOR **ALL** 13 REQUIREMENTS LISTED ABOVE, SAY THE FOLLOWING:

**Thank you for your time. Unfortunately, you and your child are not eligible for participation in this study. You may still participate in PCIT and will maintain your current status on the wait-list. You can also choose to receive other alternative treatment options available at the clinic. If you are interested in a specific treatment option provided at the Silver Child Development Center I can provide you with additional information and, if desired, submit an internal referral for services.**

IF THE RESPONDENT MEETS CRITERIA FOR **ALL** 13 REQUIREMENTS LISTED ABOVE, SAY THE FOLLOWING:

**Thank you for your time today. You and your child meet preliminary criteria for this study and are eligible to participate in a final stage-2 screening session at the Silver Child Development Center to determine further eligibility. An informed consent form will be mailed to your residence in a sealed manila envelope addressed from the primary investigator. The stage-2 screening session will be scheduled at least one week after you receive the informed consent form to ensure that you have adequate time to review the consent form and formulate any questions about the study. Please wait to sign the informed consent form until the stage-2 screening session so that any questions or concerns you may have can be addressed prior to signing consent. During the stage-2 screening session you will be asked to complete two rating scales and your child will complete a measure of receptive language skills. Please bring a signed medical or psychological report showing your child's diagnosis of autism spectrum disorder. At the conclusion of the stage-2 screening session you will know if you meet the final eligibility criteria to participate in the study.**

**Would you like to be scheduled to attend the final stage-2 screening session?**

Response: \_\_\_\_\_

**What mailing address would you like the informed consent form to be mailed to?**

Mailing Address: \_\_\_\_\_

**What day and time is convenient for you to participate in the in-person, stage-2 screening session?**

Preferred Day/Time: \_\_\_\_\_

**What is your preferred method for us to reach you?**

Contact Method/Information: \_\_\_\_\_

**You may contact the primary investigator directly with any questions or concerns about the study and/or informed consent form or you can wait to address any questions and/or concerns until the stage-2 screening session. The primary investigator, Kimberly Knap, can be contacted by phone at (904) 305-5141 or by e-mail at [kknap@health.usf.edu](mailto:kknap@health.usf.edu). Her contact information is also provided on the informed consent form, which will be mailed to your residence within one business day.**

**If you decide that you do not want to participate in the study prior to the stage-2 screening session, please contact the primary investigator in order to cancel the stage 2 screening session. If you decide not to participate in the present study, you may still participate in PCIT and will maintain your current status on the wait-list. You can also choose to receive other alternative treatment options available at the clinic. If you are interested in a specific treatment option provided at the Silver Child Development Center, then additional information about treatment options will be provided to you and, if desired, an internal referral to the treatment option will be submitted.**

**Appendix D: Demographic Questionnaire**

Date: \_\_\_\_\_

**PCIT for ASD Parent and Child Demographic Questions**

**PARENT INFORMATION**

**Your Name:** \_\_\_\_\_

**Your Age:** \_\_\_\_\_

**Your Date of Birth** (month/day/year): \_\_\_\_\_

**Your Race/Ethnicity:**

- |  |  |
|--|--|
| <input type="radio"/> American Indian/Alaskan Native | <input type="radio"/> Native Hawaiian/Pacific Islander     |
| <input type="radio"/> Asian/Asian Indian             | <input type="radio"/> Hispanic/Latino                      |
| <input type="radio"/> African American/Black         | <input type="radio"/> Multi-racial (please specify): _____ |
| <input type="radio"/> Caucasian/White                | <input type="radio"/> Other (please specify): _____        |

**Your current marital status:**

- |  |                                 |
|--|---------------------------------|
| <input type="radio"/> Single                 | <input type="radio"/> Divorced  |
| <input type="radio"/> Married                | <input type="radio"/> Separated |
| <input type="radio"/> Committed Relationship | <input type="radio"/> Widowed   |

**What is your highest level of completed education?**

- |   |  |
|---|--|
| <input type="radio"/> Less than High School     | <input type="radio"/> Two-Year College Degree  |
| <input type="radio"/> High School or Equivalent | <input type="radio"/> Four-Year College Degree |
| <input type="radio"/> Technical School Degree   | <input type="radio"/> Graduate Degree          |

**Are you currently employed?**

- Yes
- No

**Are you the child's:**

- |   |  |
|---|--|
| <input type="radio"/> Biological Parent | <input type="radio"/> Grandparent                      |
| <input type="radio"/> Adoptive Parent   | <input type="radio"/> Other (please specify):<br>_____ |
| <input type="radio"/> Foster Parent     |  |

**How many additional caregivers currently live in your home?** \_\_\_\_\_

**How many children currently live in your home?** \_\_\_\_\_

**CHILD INFORMATION**

**Child's Name:** \_\_\_\_\_

**Child's Age:** \_\_\_\_\_

**Child's Date of Birth** (month/day/year): \_\_\_\_\_

**Child's Race/Ethnicity:**

- American Indian/Alaskan Native
- Asian/Asian Indian
- African American/Black
- Caucasian/White
- Native Hawaiian/Pacific Islander
- Hispanic/Latino
- Multi-racial (please specify): \_\_\_\_\_
- Other (please specify): \_\_\_\_\_

**Does your child currently receive any therapies or services?**

- No
- Speech/Language Therapy
- Physical Therapy
- Occupational Therapy (OT)
- Early Intervention Services (Early Steps)
- Special Education Services (School IEP)
- Individual Counseling/Therapy for: \_\_\_\_\_
- Group Counseling/Therapy for: \_\_\_\_\_
- Other Therapies/Services (please specify): \_\_\_\_\_

**Does your child currently attend school or daycare?**

- Home with Parent/Relative
- Daycare (Friend/Relative)
- Daycare (Professional)
- Preschool
- Voluntary Pre-Kindergarten (VPK)
- Elementary School
- Other (please specify): \_\_\_\_\_